

# NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING



## PBXs hook to ATM

Nortel and AT&T work to give voice a say in ATM networks.

By David Rohde  
Dallas

Northern Telecom, Inc. and AT&T are taking steps to integrate their private branch exchanges with managed Asynchronous Transfer Mode networks.

Nortel last week joined Cabletron Systems, Inc. in a strategic alliance to deliver voice/data equipment managed by Cabletron's Spectrum net manager. See Nortel, page 72

Find more info on-line, including:

- A primer on ATM management.
- A listing of ATM management services offered by the major carriers.
- A look at AT&T's OneVision division in the wake of AT&T's divestiture.

Link to <http://www.nwfusion.com>. Select News+ then Front Page.



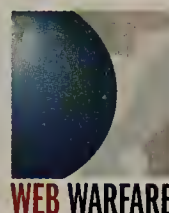
## Microsoft 'Net plan touches all the bases

Company's second Internet hypefest includes details about new products and alliances.

By Peggy Watt  
Seattle

Microsoft Corp. unfolded a vastly updated Internet road map last week, setting off on a whirlwind tour that will feature a slew of new products and a host of notable partnerships.

Analysts said it was important for Microsoft to make itself more visible in all the Internet traffic, but warned customers not to be surprised if the firm changed direction. The company aired a



sketchier plan in October (NW, Oct. 2, page 1).

Announcements included a World-Wide Web browser that will be distributed for free, open access to The Microsoft Network (MSN) and the bundling of a Web server with Windows NT. Also, Microsoft introduced a handful of tools and APIs positioned as open Internet standards (see graphic, page 12).

Making sure it has all the bases covered, Microsoft disclosed a letter of intent to license Sun Microsystems, Inc.'s Java Web programming language and unveiled VBScript, a rival to a lite version of Java announced by Sun earlier last week.

"Microsoft is hard-core about

the Internet," said Bill Gates, company chairman and chief executive officer, before a crowd

### Fight for the Web's soul

In case you hadn't noticed, all hell is breaking loose on the Internet. In boardrooms across the country, computer industry executives are plotting ways to rule the 'Net, and most see the keys to the kingdom in Web development tools.

Last week, Microsoft, IBM, Sun and Netscape cranked up their hype machines, all to convince the world to use their Web tools.

Who's going to win? Look for clues on page 8 where you'll find that:

- ▶ The Java cadre is growing.
- ▶ Java critics are emerging.
- ▶ VRML is honing its 3-D story.
- ▶ IBM is pumping up VisualAge.

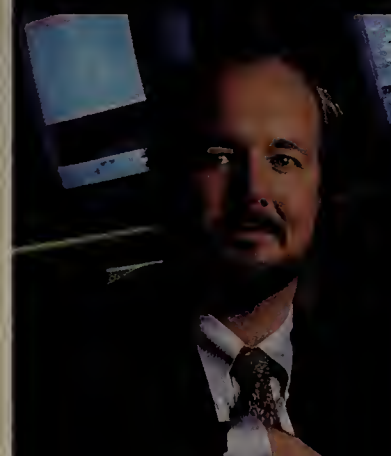
of some 400 analysts and press.

He called the Internet "a gold rush" of opportunity, and other

See 'Net plan, page 12

### In-site

## Cisco does downsizing in a big way



CINDY CHARLES

Cisco's Peter Solvik praises the flexibility of client/server apps.

By Barb Cole  
San Jose, Calif.

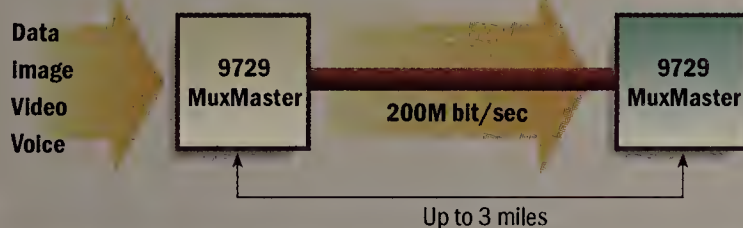
When Cisco Systems, Inc. decides to try something new, it typically goes whole hog.

For example, when the fast-growing router vendor recognized the need to join the switching market, it bought not just one switch

See Cisco, page 72

### AT THE SPEED OF LIGHT

IBM's 9729 MuxMaster multiplexer can transmit more than 20 datastreams at different light frequencies over a single optical fiber. The device can be used to wring more bandwidth out of existing campus fiber nets.



## IBM mux sees the light

By Michael Cooney  
Raleigh, N.C.

IBM this week will announce a multiplexer that uses the spectrum of light to squeeze about 20 times more bandwidth out of campus fiber nets, potentially saving thousands of dollars in cabling costs.

The 9729 MuxMaster can transmit up to 20 simultaneous datastreams at different light frequencies over a single optical fiber. The multiplexer supports a maximum of 10 200M bit/sec full-duplex channels per fiber at distances up to 3 miles. Speeds of up to 622M bit/sec are possible over shorter distances.

"The growth in information processing capabilities, ATM-based networks and storage capacity will create a demand for the communications power necessary to link multiple users and multiple sites with tons of capacity," according to IBM documents. Company officials, who have previously discussed a pro-

See Muxes, page 73

## Lotus Notes, Newsstand get Web feet

By Carol Sliwa, Kevin Fogarty and Doug Barney  
Cambridge, Mass.

Everything's heading the way of the Internet, and Lotus Development Corp.'s Notes client and electronic publishing service are no exceptions.

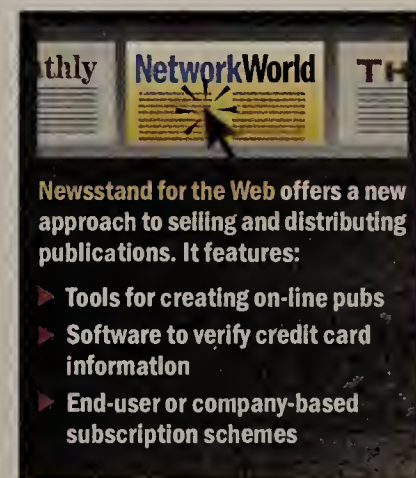
Lotus this week will announce a replacement for its ill-received Notes Express, which is designed to give Notes clients less expensive World-Wide Web access and core electronic mail capabilities.

Lotus will back its Notes Release 4 client developments next month when it announces a Web version of Notes:Newsstand at

Lotosphere '96, the Cambridge, Mass., company's annual customer conference.

Separately, Lotus is said to be readying a more traditional client/server pricing scheme for Notes. Sources said the lowest end client will cost about \$50, while the price of a Notes server may rise from \$495 to between \$1,000 and \$2,000. Lotus still will

See Newsstand, page 73





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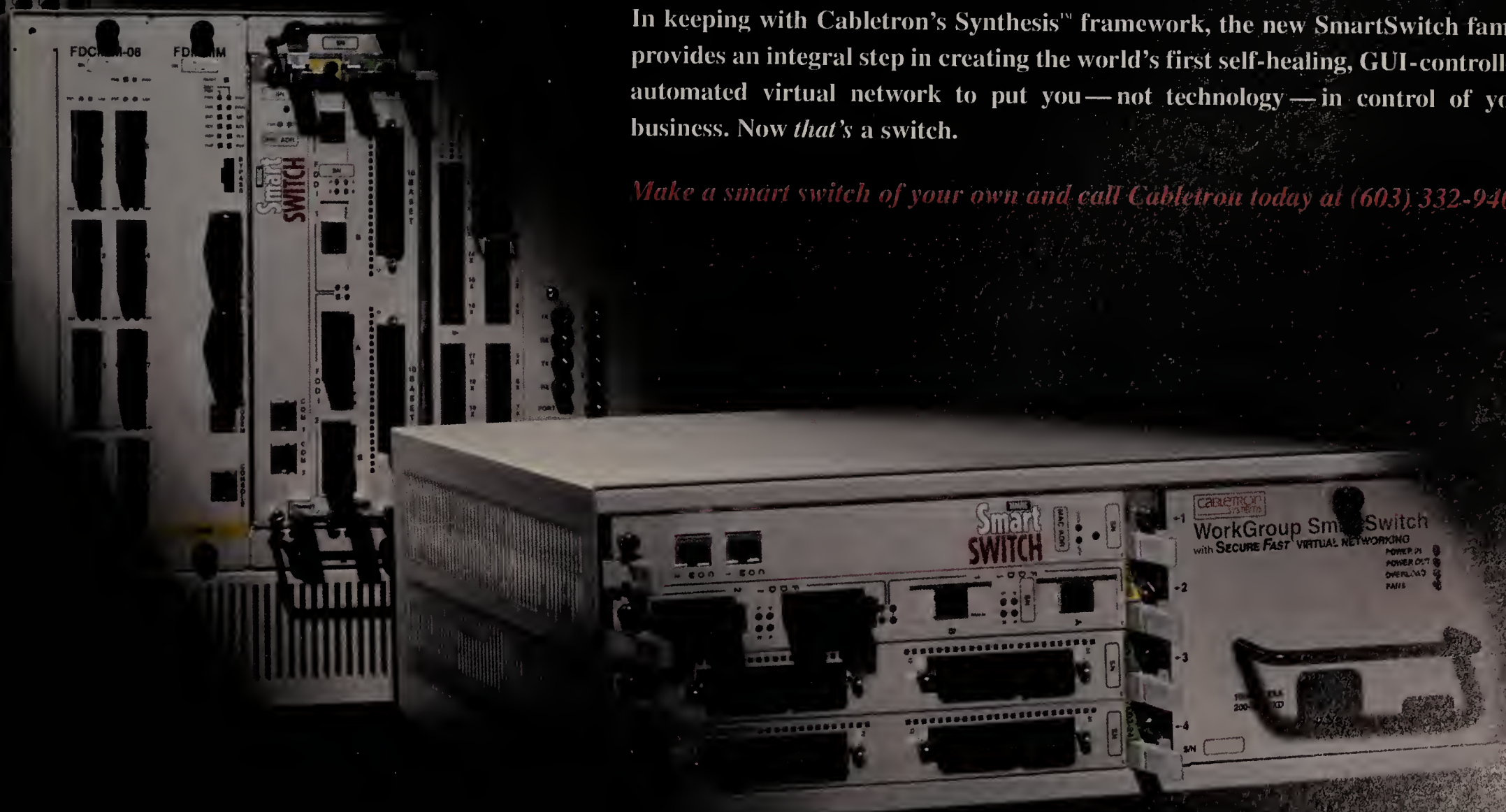
## *Let's Talk Flexibility*

Whether you're starting from scratch or building off an existing network, SmartSwitches are the perfect fit. The MMAC and MMAC-Plus SmartSwitches protect investments as they leverage the security and reliability of a "smart hub." The modular Workgroup SmartSwitch provides up to 48 switched Ethernet ports as well as a high-speed uplink, and includes many of the same fault tolerant features you'd expect from a Cabletron hub.

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## This Week



### News+

#### The Front Page:

- Drink up Java resources, including a guide to using JavaScript.
- Download Bill Gates' talk — and slides — on Microsoft's Internet strategy.
- Read up on the key components of Lotus' Internet applications.

#### The Technical Sections:

- Grab the plan to use wireless technology to build smart highways, in WANs & Internetworking.
- Whet your information appetite with Tasty Bits from the Technology Front, a roundup of news and analysis of electronic commerce and the Internet.



### Forum

**Your side:** Have any tips for somebody who wants to build a large SMTP mail net? Go to Topic 21 in Help Desk.



### NetRef

**Technology Resources:** We join the Java generation with a new page on Internet programming, under Internet/Web.

#### Other areas

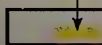
- **Professional Development:** New seminars.
- **DirectConnect:** Download demo software.
- **Network World Central:** Get in touch with us.

## this week's pick

All alone in the Unix world? Newton Love has compiled a listing of Unix user groups around the world, from the University of Waterloo's AIX Support Group to the Washington Area Unix Users' Group. Link to [http://dark.wustl.edu/~newton/othr\\_uug.html](http://dark.wustl.edu/~newton/othr_uug.html).

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# NetworkWorld


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# Contents

## News

- 6** Ascom Timeplex experiments with new ATM architecture at Cambridge University.
- 10** First Virtual designs ATM gear for multimedia apps.
- 10** Fore snaps up wide-area ATM equipment vendor.
- 10** Cabletron taps into market for workgroup switch.
- 12** Inference readies help desk tool that solves problems over the Web.
- 12** Microsoft boosts SNA Server with gateway.
- 14** NetFRAME dives into NT server waters.
- 14** Database vendors crawl further into the Web.

## WANs & Internetworking

-  **15** Atlanta trains network to handle bulging Olympic traffic.
- 15** Cisco has long-term plan to manage switched internetworks.
- 15** Inacom adds managed frame relay service to network menu.
- 16** RadioMail branches out to broadcast over cellular and dial-up links.
- 22** Cable & Wireless sets up eight overseas Internet-access nodes.
- 23** IBM to roll out range of ATM wares in 1996.

## Local Networks

- 27** Fore hits a sweet spot with higher end ATM switches.
- 27** Newbridge shows off its LAN-emulation technology at VLAN show.

### SPECIAL FOCUS Server management

Server vendors move beyond hardware to battle on the management software front. See page 31.

## Client/Server Applications

- 35** Oracle pitches InterOffice as simpler, more cost-effective database solution for remote users.
- 35** Microsoft primes SQL Server for data warehousing and other high-end apps.
- 36** BMC links Patrol tool with platforms from Cabletron, HP and Tivoli.

## Electronic Commerce

- 41** SBT adapts staid world of accounting software to untamed 'Net.

## Technology Update

- 43** Paging technology frees network staff from the confines of management consoles.

**NetworkWorld's Mission:** To provide news and analysis that help network IS professionals deliver the network computing infrastructure and distributed applications required to meet evolving business needs.



**Zach Rinat**, president of Spider Technologies, said his firm's newly released Web software bypasses limitations of CGI. Page 35.

## Features

**Buyer's Guide to bandwidth managers.** We sift through all the shapes and sizes to help you find the best fit. Page 49.



**Pleased to meter you.** Four software metering applications that offer a polite way to stay on top of licensing requirements. Page 53.

## Management Strategies

- 58** Round up existing E-mail costs before considering client/server architecture.
- 58** Book series covers hot technology topics.

## Opinions

- 19** Scott Bradner sees value of sure and obscure packets.
- 28** Dave Kearns examines Microsoft's NetWare connectivity tools.
- 30** Skip MacAskill and Melinda Le Baron suggest you hurry up and wait for ATM.
- 36** Mike Rothman "exchanges" his opinion on forthcoming Microsoft messaging product.
- 41** Mark Gibbs finds firms are not ready for EC.
- 46** Editorial: What's your exit strategy?
- 46** John R. Rymer discusses Microsoft's enterprise potential.
- 47** Sen. Russell Feingold denounces telecom bill as free-speech infringement.
- 74** Back to Reality: A high-tech way to plug pesky holes in network security.
- 74** Abend: A compilation of on-line oddities.

**Network Help Desk.** Page 43.

**In-Box.** Letters from our readers. Page 47.

**Editorial and advertiser indexes.** Page 71.



## News briefs, December 11, 1995

**Frame relay blasts off at Apollo**

■ Apollo Travel Services last week announced that it will use AT&T's InterSpan frame relay network services as part of a client/server initiative to distribute its computer reservation system to 15,000 travel agency sites throughout the U.S. Apollo — owned by United Air Lines, Inc., USAir, Inc. and Air Canada — will run TCP/IP over the network to enhance computer response times and support electronic mail, Internet access and peer communications among the agencies.

**3Com keeps switching PACE**

■ 3Com Corp. this week will announce plans to finally start shipping its Priority Access Control Enabled (PACE) switching technology with several of its LAN switches, including its LinkSwitch 1000 Ethernet device. PACE, announced in October 1994, offers a traffic prioritization scheme to let users run real-time voice and video applications over switched 10M bit/sec Ethernet links. 3Com officials confirmed that the company will unveil a road map of PACE-enabled products as well as enhancements to its LinkSwitch line.

**Wang gets to know Avail**

■ Wang Laboratories, Inc. last week acquired storage management software maker Avail Systems Corp. of Boulder, Colo., for about \$32 million. Wang will use the Avail technology as the basis for new storage management products for networks based on Microsoft Corp. operating systems.

**Aiming lower**

■ IBM's outsourcing arm, Integrated Systems Solutions Corp. (ISSC), last week announced a computer and network outsourcing service designed for small and midsize businesses. ISSC has focused solely on outsourcing large business enterprises in the past. Midrange Services is a suite of information technology services that will include help desk, network management and inter-networking components.

**Don't look: Cyber smut ban advances**

■ By a razor-thin 17-16 margin, conferees from the House of Representatives chose a tough version of a proposed antismut law for on-line services that virtually matches a Senate-passed provision. The standard would impose penalties for people making indecent material available to minors, which is widely interpreted to mean foul language and graphic sexual material. But the antismut law is part of the larger telecommunications reform bill, which still awaits many more agreements by the House-Senate conference before moving forward.

**Wanted: Net management exec**

■ Hewlett-Packard Co. last week said Robert Hoog, general manager of the company's Network and Systems Management Division, has resigned for personal reasons. Under Hoog, HP's OpenView became the leading network and systems management platform in terms of market share, according to International Data Corp. in Framingham, Mass., despite HP's delay in delivering a distributed version of the product. HP has not yet named a successor.

**Bay plots ATM, RMON moves**

■ Bay Networks, Inc. next year plans to unveil four-port Asynchronous Transfer Mode interfaces for its Centillion 100 switch. The device has an ATM switching fabric at its core and currently supports token-ring, Ethernet and two-port ATM switching modules. The four-port modules, expected in the first half of 1996, will allow users to configure the Centillion 100 as a 24-port ATM workgroup and backbone switch. Separately, Bay and Concord Communications, Inc. are expected this week to announce a cooperative development and marketing agreement whereby Concord will deliver automated reporting and analysis products that leverage the Remote Monitoring (RMON) and RMON2 capabilities of Bay's Advanced Analyzer agent software.

# ATM architecture could run rings around SONET

By Tim Greene

Cambridge, England

Fresh on the heels of a successful two-month trial at Cambridge University, Ascom Timeplex, Inc. is putting the finishing touches on an ATM switch and ATM optical fiber campus architecture it hopes to market next year as a marriage of the best of SONET and ATM.

While offering the high bandwidth capacity and low latency of Synchronous Optical Networks, the architecture — known as ATMLite — uses pure Asynchronous Transfer Mode cells and can set up and tear down virtual circuits of varying bandwidths on demand.

At 1.25G bit/sec on the fiber rings, ATMLite offers dramatically higher bandwidth than meshed networks based on time-division multiplexing (TDM). And it lets TDM users adopt the architecture without swapping

While the company would not discuss price, it said the architecture offers the redundancy of dual rings at a lower cost than SONET.

**Remote learning trial**

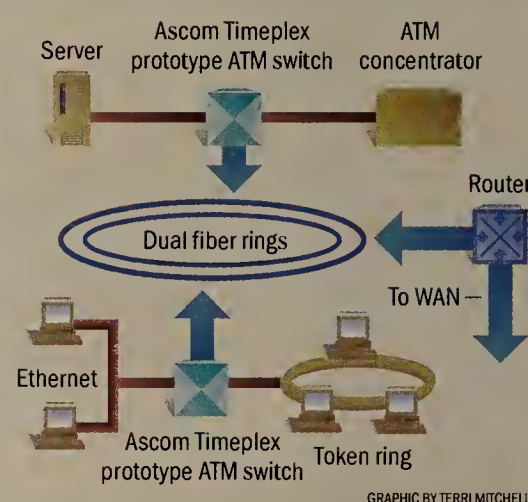
The trial, funded by the European Union (EU) under the Research into Advanced Communications Environments (RACE) Hipernet program, used a single dark-fiber ring 50 km in diameter at Cambridge University. The network supported remote learning for language classes.

The network comprises seven 486 PCs fitted with 25M bit/sec ATM cards, one IBM server and two Ascom Timeplex prototype switches. Students on PCs could remotely call down educational videos on demand from the server and videoconference with teachers.

The switches have four ports,

**WHO NEEDS SONET?**

Ascom Timeplex has completed testing a campus ATM network architecture at Cambridge University that relies on switching pure ATM cells across fiber rings at 1.25G bit/sec. The architecture eliminates the need for implementing frame-based SONET technology or setting up meshed ATM switch-based campus nets.



out existing TDM equipment, according to Thomas Nolle, president of CIMI Corp., a technology assessment firm in Voorhees, N.J.

TDM muxes that interface with T-1 or T-3 links in a traditional TDM net would instead interface with an ATM concentrator that would convert the mux traffic to cells. The concentrator would pass those cells along to a new Ascom Timeplex switch that functions as an access node to the fiber ring.

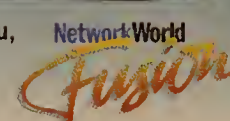
each of which can run at speeds up to 155M bit/sec. There is no limit on the number of switches that can be installed on a ring, and they can establish up to about 65,000 virtual connections over that ring simultaneously, according to Thomas Martinson, director of the project for Ascom Tech, the Ascom Timeplex research division in Switzerland.

During the trial, the network backbone was loaded to 1.25G bit/sec by a Hewlett-Packard Co.

A user wants to build an SMTP-based messaging system for several thousand users in two dozen locations.

What would you recommend for servers, clients, configuration and tools?

Link to <http://www.nwfusion.com>. From the main menu, select Forum, Help Desk and nwfusion.talk, then Topic 21 in Help Desk.



Read more on-line, including:

- ▶ An introduction to Hipernet
- ▶ Ascom Timeplex white papers on ATM and SONET

Link to <http://www.nwfusion.com>.

Select News+ then WANs and Internetworking.



ATM tester. Ascom Timeplex plans to expand that capacity to 2.5G bit/sec by the time the switches are ready for market toward the end of 1996.

**Fine-tuning**

In addition to adding interfaces to the wide area, Ascom Timeplex wants to incorporate network management features and signaling capabilities into the switch. Signaling would reserve bandwidth and quality of service to establish connections and then release the bandwidth when the connection was no longer needed.

Each device electronically switches cells that come from the LAN ports as well as cells from the ring that are addressed for equipment on the LAN side of the switch.

Independently, it sorts cells optically as they pass through the node on the ring. Those addressed for elsewhere are transferred, those addressed for that node are dropped onto the switch, and those outbound from the switch are added in.

"It acts as a drop-and-insert cell multiplexer," said Michael Valiant, Ascom Timeplex marketing director for Europe, Africa, Asia and the Middle East.

On the ATMLite network, each node introduces about 8 microsec latency. That is less than would be introduced by other switches, and traffic on an ATMLite net would pass through fewer nodes, Martinson said.

The switch is compliant with ATM Forum standards, so, theoretically, it could interoperate with other standards-compliant devices made by other vendors.

"People already have quite a lot of ATM switches in workgroups, and we have users who want to integrate them in a network. For this, we need to be able to interconnect switches from different manufacturers," Martinson said.

The company is also working on modular interfaces, such as 155M or 100M bit/sec TAXI ATM, depending on what the user needs. ■



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# Claims of Java potential overblown, experts warn

**By John Cox**  
Mountain View, Calif.  
Corporate developers who want to use Sun Microsystems, Inc.'s Java programming language should move cautiously, ignoring Sun's extravagant claims about Java and not putting too much faith in last week's endorsements of the language by IBM and Microsoft Corp.

Developers and analysts pointed out that Java still is in beta test, and when released early next year, it will be labeled "Release 1.0," indicating that the language is still very new. Though Sun promises that Java can handle the most demanding commercial applica-



graphical tool sets for Java, but they are not expected until sometime in 1996.

And the much ballyhooed JavaScript, being developed with Netscape Communications Corp. as an easy-to-use script interface for manipulating Java objects, is only available as part of the beta version of Netscape's Navigator 2.0.

Among other challenges, Sun must make sure the public language specification moves forward in an orderly way, Goulde said. "If people start extending Java in proprietary ways, as Netscape and others have with the HTML, that could hurt Java," Goulde said.

Another issue not yet dealt with is how and when Java will work within distributed object environments.

## The plus side

Nevertheless, last week's endorsements are important in solidifying Java as the de facto standard for building interactive Web and distributed applications.

"Microsoft's decision to license Java validates the model of having many tools producing compatible applications that will run in any Java-enabled environment," Goulde said.

Developers working with the test version of Java, now in its final beta stage, reported that Sun has done an excellent job of crafting a language ideally suited for deploying applications on WANs.

"What we see Java doing is transform the Web browser, which acts like a dumb terminal today, into an application platform," said Mark Yohai, director

of Internet applications at Applix, Inc., a Westborough, Mass., vendor of ApplixWare, a client/server spreadsheet application.

"The browser then provides faster computing power on the desktop and becomes a window to all the other computers on the Internet," he said.

Java was announced last May. Sun engineers labored to create a C++-like object-oriented language that scrapped a lot of the internals that made C++ unsuitable for networked applications and just plain hard to learn and use.

One key change was making Java an interpreted language. When a user downloads the application from a Web server, the Java interpreter, residing on the user's PC, interprets or translates the application into terms the specific operating system understands.

As a result, the same Java application runs, in theory, on any operating system to which the interpreter, called the Virtual Machine, has been ported. ■

# Java camp gets bigger with ally announcements

**By Peggy Watt**  
San Francisco  
Dozens of vendors gulped from Sun Microsystems, Inc.'s cup of Java last week, joining the company and partners Netscape Communications Corp. and Silicon Graphics, Inc. (SGI) in declaring they won't let Microsoft Corp. dominate the Internet.

But Microsoft licensed Java a few days later, announcing the deal along with a spate of Internet products and marketing plans (see story, page 1). Latecomer IBM also announced it will license Sun's open standard, Web-oriented development language.

At the Web Innovation Conference here last week, the Sun-



"One company doesn't dominate the industry by having control of its APIs, development tools and standards."

Netscape's Marc Andreessen

Netscape-SGI team described their vision of the browser displacing existing operating systems as the access point to everything on the network, be it a corporate intranet, or the Internet or World-Wide Web.

"The client will serve as a universal browser, and the application logic will be spread out across the network," said Marc Andreessen, Netscape founder and chief technology officer. "And one company doesn't dominate the industry by having control of its APIs, development tools and standards," Andreessen added.

But it was not just anti-Microsoft sentiment that rallied 28 companies to endorse JavaScript, a graphical scripting language.

"The way the 'Net and the Web have happened is uncontrollable by one company," said Tom Jermoluk, president and chief operating officer of SGI, which introduced a suite of development tools that build on Java technology.

Eric Schmidt, Sun's chief technology officer, said, "With open, scalable interfaces, the technology is not controlled by any one vendor."

Vendors planning to implement JavaScript include Computer Associates International, Inc., Oracle Corp., Novell, Inc., Digital Equipment Corp., Hewlett-Packard Co. and others. ■

## VRML alive and kickin'

**W**ith all the talk about Microsoft Corp.'s Internet plans and Sun Microsystems, Inc.'s Java, you'd think VRML was virtually dead. Far from it, though—at least based on a bevy of vendors last week announcing plans to build hooks to the three-dimensional Web site development system.

Microsoft, for one, announced ActiveVRML, an extension to the Virtual Reality Modeling Language.

The Microsoft offering is designed for development and running 3-D, multimedia applications on Windows and Macintosh machines. Microsoft believes that it holds the key to VRML's success.

"VRML is at the playstage now," said Craig Mundie, a product manager at Microsoft. "We'll tune it for all the platforms, then get hardware companies to build accelerators for it."

Separately, competitors Sun and Netscape Communications Corp. teamed to endorse VRML from Silicon Graphics, Inc. (SGI).

SGI just released Version 1.1, which addresses sound and object behavior, and adds full interaction with Java.

SGI also introduced Cosmo, a set of multimedia programming tools due in mid-1996 that builds on Java and SGI's own VRML.

By Peggy Watt

*Microsoft's decision to license Java validates the model of having many tools producing compatible applications that run in any Java-enabled environment.*

tions, most developers today seem to be rewriting only client-based applications that talk with server programs.

"We're using Java in our application to build the client-side application, to address the issue of getting the application to many operating system platforms without enormous porting efforts," said Sam Pendleton, senior member of technical staff at Cadis, Inc., a Boulder, Colo., vendor of an object-oriented search-and-retrieval engine. "Is Java something we'll use to do the server in? I don't know yet. The jury is still out."

Michael Goulde, a senior analyst at Patricia Seybold Group, Inc., a Boston technology research company, said corporate developers should start small. "We're talking about the first generation of a new language," he said. "It has to mature."

## No tooling around

Java also is hampered by the almost complete lack of anything approaching a full application development tool set.

Sun and others are building

## IBM claims VisualAge Web edge



WEB WARFARE

**By Ellen Messmer**  
New York

Here's a quick quiz. The future standard for Web development is:

- A. Java
- B. Visual Basic
- C. VRML
- D. VisualAge

Though it could be wishful thinking, IBM hopes the industry will pick VisualAge, its low-profile programming environment set to be enhanced next

year for the World-Wide Web.

With VisualAge for the Web, which IBM demonstrated here at DB Expo last week, corporations can run VisualAge client/server applications on a Web server that can be read by any standard HTML browser.

VisualAge for the Web converts information sent to a browser into HTML and, likewise, converts HTML data from a browser into VisualAge. "The actual code executed on the server is in VisualAge," pointed

out Brian Hogan, associate software engineer at IBM.

The value of this approach, according to Andrew Clark, IBM's manager of Internet applications, is that companies can leverage their internal VisualAge applications for databases, CICS, Advanced Program-to-Program Communications or TCP/IP without having to write new code in HTML or Java.

Although IBM did license Java from Sun Microsystems, Inc. last week, Big Blue preferred to talk about what VisualAge for the Web could do for you.

"Our strategy [with Visual-

Age] proposes to let customers capitalize on and exploit existing legacy systems," Clark said.

At least one software developer is betting that companies will adopt VisualAge in lieu of Java when it comes to the Web.

Mountain View, Calif.-based start-up Corretti Soft, Inc. plans to manage a Website on behalf of hotels and airlines that want to take reservations over the Web.

When users with Web browsers try to make reservations, the Web server will have to perform a real-time check of a hotel's remote database to ascertain availability. ■

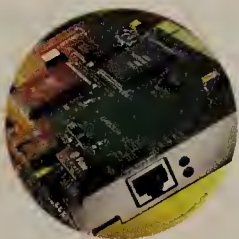




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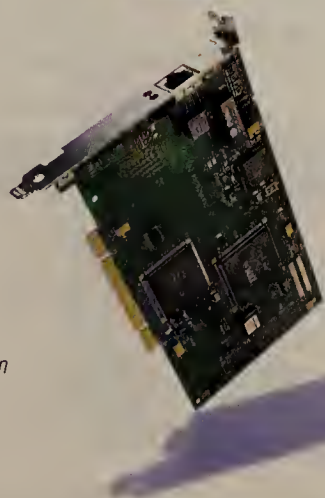
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# FVC tools tap ATM for multimedia apps

By Jodi Cohen

Santa Clara, Calif.

Ralph Ungermann's First Virtual Corp. (FVC) last week unveiled new Asynchronous Transfer Mode products that will allow users to participate in a desktop videoconference, share a PC application, video clip or document, and browse the Internet, all at the same time.

As long as they have PCs with high-quality videoconferencing equipment from firms such as PictureTel Corp., plus FVC's

First-Family of multimedia net products, users can collaborate on projects, despite location.

FVC's new First multimedia net products include an ATM switch, ATM/ISDN gateway and World-Wide Web servers. All of the new products — and the PC clients — run FVC's existing Multimedia Operating Software (MOS) to let users create multimedia windows on a PC.

MOS is middleware that lets Windows applications take advantage of ATM's quality-of-ser-

vice abilities. The software runs on NetWare, Windows 3.11, Windows 95, LAN Server and LAN Manager operating systems.

For example, the desktop multimedia gear would be useful in the health care industry by a doctor who consults with a specialist in another part of the country, Ungermann said. The doctors could view the patient's test results, records and X-rays while discussing treatment via a videoconference.

But Thomas Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J., said that most users are not ready for ATM applications, and even those who are already looking at videoconferencing will be a hard sell.

"The problem is that most people who are going to use videoconferencing are already using it, so this would be an incremental commitment for a lot of organizations," Nolle said.

## The products

FVC's new First Multimedia modular switch — which would sit in the center of the network — offers eight 25M bit/sec ATM ports and can be expanded to support as many as 24 users per box. The device also supports a mix of interface modules, including a 25M bit/sec ATM port for desktop connections, Ethernet and token-ring ports for LAN access, and a 155M bit/sec ATM port for server or backbone links.

The device supports switched virtual circuit signaling and

LAN-emulation standards.

In addition, FVC enhanced its First Multimedia Gateway Server — an ATM/ISDN gateway — to now include ISDN Primary Rate Interface and T-1 WAN support. Previously, the device only offered Basic Rate Interface support. The gateway allows desktop videoconferencing clients to communicate via the server, instead of needing a direct ISDN line for each PC.

FVC also announced the First WWW server, which allows Internet users to cache data, graphics and videostreams off of the Web in an existing First Multimedia Storage Server.

The switches range in price from \$7,000 to \$16,000, depending on configuration, and the ATM/ISDN gateway server is priced at \$12,000. Both will be available in January.

©FVC: (408) 567-7200.

# Fore buys its way into the enterprise ATM net market

By Jodi Cohen

Pittsburgh

Fore Systems, Inc. last week announced the \$36 million acquisition of wide-area ATM equipment vendor CellAccess Technology, Inc., a move designed to help Fore reach beyond the LAN backbone.

The purchase will enable Fore — a leader in the market of Asynchronous Transfer Mode products for the LAN and campus network — to position itself as an enterprise network player.

"They're betting users won't want to go to one company for the first 100 meters and go to some other company for the rest," said John Coons, an analyst at Dataquest, Inc. in San Jose, Calif.

The acquisition of CellAccess marks Fore's third buyout this year. CellAccess brings to the table a line of ATM multiplexers that offer up to four interfaces supporting fractional T-1, 64K bit/sec serial and Ethernet connections.

These interfaces allow users to support a mix of applications and services, including private branch exchange trunking, videoconferencing and Ethernet bridging over ATM.

Coons expects that users will find the low-end multiplexer, which is priced at \$6,500, a good option for tying together a mix of ATM LANs with remote devices over a wide area.

"Instead of voice, video and data going over separate lines, they can all go over one WAN line," he said. "And that can include existing LAN traffic, with no upgrade needed except [for installing] one of the ATM access boxes."

Fore plans to add its ForeThought internetworking software to the CellAccess muxes, which will allow remote users to access the ATM backbone over switched virtual connections, instead of private virtual circuits.

John Nichols, manager of systems engineering at Virginia Polytechnic Institute and State University in Blacksburg, already uses CellAccess mux and Fore switch products. He figures the Fore acquisition will help simplify net management.

"This means that Fore will extend its ForeView platform to include the CellAccess devices, which makes it easier to integrate and manage with one net manager instead of having a separate net manager for each device," he said.

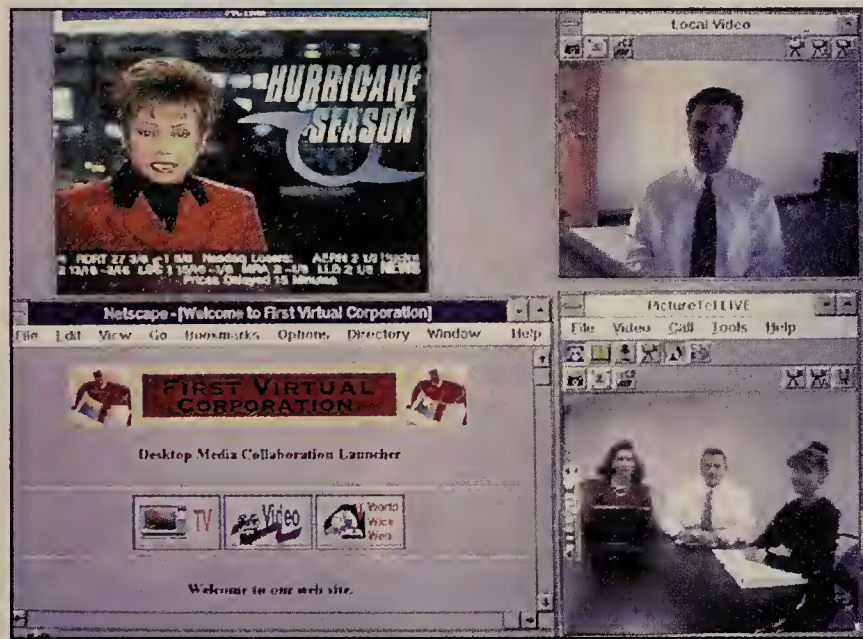
Fore officials confirmed that ForeView will be enhanced to enable central control of CellAccess muxes.

According to Bob Schiff, Fore's marketing director, the CellAccess deal comple-

ments the company's existing partnerships with ATM WAN access vendors ADC Kentrox and Premisys Communications, Inc. He added that Fore in January will unveil a suite of access products that include all three WAN vendors' devices: The CellAccess device will address speeds of 1.5M bit/sec, the Premisys box will support 24M bit/sec, and the Kentrox product will offer up to 500M bit/sec total bandwidth.

"There is similarity among the access products in interoperability, but the speeds and feeds vary quite a bit from platform to platform," Schiff said.

©Fore: (412) 772-6600 or (408) 395-9150.



FVC's ATM multimedia equipment lets a desktop user participate in a group videoconference, while also viewing a live CNN broadcast and accessing a Web home page.

# Cabletron's workgroup switch stands alone

By Jodi Cohen

Rochester, N.H.

Cabletron Systems, Inc. last week made it easier for its customers to buy a wide range of networking gear from one vendor — which users said could simplify virtual networking — when it rolled out its first stand-alone workgroup switch.

The company also took the opportunity to breathe new life into its core hub line with new switching modules, as expected (NW, Sept. 25, page 10).

Bill Hoke, network engineer at Westinghouse Electric Corp. in Pittsburgh, is evaluating Cabletron's stand-alone SmartSwitch device to help boost net bandwidth to centralize servers in his smaller sites.

"I'm glad that I can get all my equipment from a single ven-

dor," Hoke said. "This will make it a lot easier for us to do virtual networking because that is going to be a single-vendor solution in the near-term."

The new Workgroup SmartSwitch stand-alone device represents Cabletron's first move to directly compete with mid-range products such as Cisco Systems, Inc.'s Catalyst 5000 switch. Cabletron traditionally has focused on the high end of the network market.

"Cabletron is certainly trying to offset some of the momentum that Cisco has been gaining; that's who everyone is chasing at this point," according to Skip MacAskill, senior research analyst at the Gartner Group, Inc. consultancy in Stamford, Conn.

Although Cabletron has dubbed its stand-alone device the Workgroup SmartSwitch, MacAskill said it is somewhat of a misnomer.

"Cabletron is really

positioning the device at the backbone level," he said. "It's a workgroup switch in that it will aggregate a large number of workgroup segments, but it's not really going to compete with Cisco's ProStack or Bay [Networks, Inc.'s] 28000 product lines and target actual workgroup deployments."

The Workgroup SmartSwitch is a stand-alone modular device that can be configured to support as many as 48 ports of Ethernet switching along with a

See Cabletron, page 73

## Cabletron's new SmartSwitches

Product	Price
MMAC SmartSwitch wiring closet switch	\$2,595
Workgroup SmartSwitch	\$3,595
SmartSwitch controller module	\$13,695
FDDI network interface module	\$6,395
Ethernet network interface module	\$12,395

All products will ship in 90 days.





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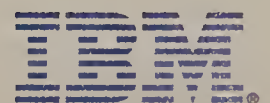


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## Application development

## Open Horizon unites workgroup and enterprise applications

By John Cox  
New York

Open Horizon, Inc. last week introduced middleware that will let companies build applications with workgroup client/server tools such as PowerBuilder and still take advantage of server-based business rules and enterprise transaction systems.

The new Application Broker product could prove ideal for MIS groups trying to build three-tier, graphical user interface (GUI)-based applications that

can reach beyond a single database to access network-based programs and services running on disparate application servers. The software was unveiled here at DB Expo.

The University of Arizona is planning to move to a three-tier information architecture and may use Application Broker, said John Detloff, a development specialist with the school's Student Information System (SIS) 2000 advanced technologies group.

Open Horizon's product supports two key standards that make it attractive for such a project, Detloff said. One is Microsoft Corp.'s Open Database Connectivity (ODBC) specification, and the other is the Open Software Foundation, Inc.'s Distributed Computing Environment, a set of distributed application services that forms the core of Open Horizon's Connection product line.

SIS 2000 will build a prototype three-tier application architecture by maintaining key administration systems on exist-

ing mainframes, gradually shifting functions to Unix servers and using Transarc Corp.'s Encina transaction processing monitor in the middle tier.

PowerBuilder is used for creating client applications, and Application Broker bridges these and the other services.

PowerBuilder application developers will be able to use standard ODBC to call what appears to be a list of database stored procedures in the Application Broker.

In fact, these stored procedures represent an array of server-based logic and business rules, including Encina, mainframe transactions and application logic.

The developers of these services use the Application Broker's GUI to register these services. And a pack of third-party enterprise application development tool vendors, such as Dynasty Technologies, Inc. and Forte, Inc., are adapting their products to generate and load the registration information into Application Broker.

Application Broker requires Open Horizon Connection Client and Connection Server, which form the underlying connections and services. Existing client applications require no changes at all, according to Chip

Overstreet, director of marketing at Open Horizon in Belmont, Calif.

Connection Client runs on Windows 3.1 and Windows NT, and several Unix operating systems. The Connection Server runs on NT, OpenVMS and Unix

variants, and supports any ODBC-compliant database manager or native database APIs.

Application Broker will be available by April, and pricing will start at about \$195 per user.

©Open Horizon: (415) 598-1200.

## Inference preps help desk with Web appeal

By Ellen Messmer  
Novato, Calif.

Inference Corp. is adapting its CasePoint help desk product typically used in 800-number call centers to the World-Wide Web.

CasePoint WebServer will let a company use its Web site to provide immediate answers to questions posed by customers using browsers.

In fact, Broderbund Software, Inc. will begin using the Web help desk product right after Christmas to field questions about its CD-ROM products.

CasePoint WebServer works with the same kind of case-based reasoning found in Inference's other diagnostic database applications.

Despite the Internet explosion, Broderbund does not expect Web-based customer response to replace call centers for the bulk of customer inquiries, said Mason Woodbury, vice president of Broderbund's marketing services.

But CasePoint WebServer will let Broderbund provide immediate response to customer questions on a 24-hour basis through its Web site at [www.broderbund.com](http://www.broderbund.com). In contrast, Broderbund's call centers are only open 6 a.m. to 6 p.m., according to Woodbury.

CasePoint WebServer will support a guided search to problem resolution directly with the Web user.

"It's a conversational paradigm," said Nobby Akiha, Inference's vice president of marketing.

CasePoint WebServer, now in beta, will be shipped first quarter of next year.

©Inference: (415) 899-0100.

## Microsoft takes aim at SNA users

By Michael Cooney  
Redmond, Wash.

Microsoft Corp. this week will add a distributed gateway feature to its SNA Server that will reduce wide-area bandwidth requirements and help users deal with growing remote access demands.

The new SNA Server Distributed Gateway Service pack is the first in what is expected to be a line of new products from Microsoft under its new SNA Open Gateway Architecture (SOGA), which is already being supported by some big partners.

The distributed gateway software — a free upgrade to users of SNA Server 2.11 — will let users concentrate SNA traffic at branch offices, rather than routing all remote traffic directly to a central site. That should minimize the number of wide-area links required to support branch offices.

SNA Server is a Microsoft BackOffice application that runs on the Windows NT Server platform and connects workstations to IBM mainframes or Application System/400s.

The SOGA architecture defines a number of options for linking SNA Server connectivity, including the new Distributed Gateway approach and the traditional approach, where remote routers or other LAN devices feed LAN traffic destined for the SNA host to a central SNA Server in a data center. SOGA also defines how hardware and soft-

See Microsoft, page 72

## 'Net plan

Continued from page 1

Microsoft officials said the company will move aggressively to win business from companies setting up intranets based on Web servers and browsers.

"Users want one paradigm for searching and viewing information," said Paul Maritz, group vice president of Microsoft's platforms group. "Possibly the biggest market for Web servers is the intranet market."

As a result, the company is building HTML viewers into its Microsoft Office desktop applications and preparing Internet extensions to Windows 95, adding Web directories to LAN directories that are already supported.

The Microsoft Exchange messaging server will get a Web Connector so users can access its public folders with any browser. And Microsoft will bundle its Internet Information Server — formerly known as Gibraltar and now in beta test — with Windows NT to encourage Internet links among all of its BackOffice server applications.

Most of the enhancements are scheduled to ship next year.

The disclosures successfully

deflect recent criticism that Microsoft lacked a coherent Internet strategy, according to analysts.

"Microsoft gets it and understands the tight synthesis between applications in this mar-

### Microsoft's 'Net announcements

- ▶ Licensed Java from Sun.
- ▶ Introduced Explorer 2.0 browser and announced plans to distribute it free.
- ▶ Unveiled Internet Information Server (formerly Gibraltar) and promised its release in Q1 1996.
- ▶ Launched Visual Basic Script, a competitor to Sun/Netscape's new JavaScript.
- ▶ Renamed Blackbird Web tool as Internet Studio.
- ▶ Debuted Active Virtual Reality Modeling Language.
- ▶ Signed cross-licensing deal with Oracle for Web tools.
- ▶ Repositioned The Microsoft Network as an Internet access service.

ket," said Allen Weiner, principal analyst for on-line strategies at Dataquest, Inc. But he cautioned that Microsoft cannot just grab market share with its bold move of giving away Explorer. Version 2.0 is available for Windows 95 now, and Microsoft

announced versions for other platforms in the Windows family plus Apple Computer, Inc.'s Macintosh.

"Market share is only part of the game," Weiner said. "The other part is mind share, and Netscape [Communications Corp.] has that worldwide."

In fact, Netscape stock dropped 28 points the day of Microsoft's announcements. Microsoft stock was essentially unchanged at the end of the day.

"We'll see whether Microsoft can build up the same sort of cult as with Windows," said David Readerman, managing director of brokerage firm Montgomery Securities in San Francisco. But he said the strategy statements should satisfy the financial community, which had been skittish about Microsoft's low Internet profile.

Microsoft can shift direction as needed, but at least customers know its current route, said Amy Wohl, analyst and editor of "Trendsletter" in Narberth, Pa. "The vision is very complete. They're using the Internet as a wide-area network between the intranet and the World-Wide Web."

Microsoft is even opening its fledgling private on-line service,

MSN, to general Internet access. The MSN.COM site already is in operation.

Apparently, MSN content providers did not want to limit their exposure to the 3-month-old service, which some observers have criticized as an outdated model.

"Our role as an on-line service [provider] is to make it easy for users to find what they need," said Pete Higgins, group vice president for Microsoft's applications and content group. Microsoft will build a directory of Web resources and post it on MSN but still charge for its own specialized content.

Gates also noted that Microsoft is working now with broadband technology in anticipation of interactive TV and video transmissions across the Internet. The company is developing a compact, real-time operating system technology for use in diskless set-top boxes that may provide widespread consumer access to the Web. "We'll be ready for that next generation," he said. ■

## COMMENTS?

See "How to reach us" on page 5.





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# NetFRAME, Remedy move to NT

## NetFRAME reaches beyond NetWare servers

By Ben Heskett

Milpitas, Calif.

NetFRAME Systems, Inc., a company that has long had a singular NetWare focus, will turn its gaze toward the growing legion of Windows NT users.

NetFRAME will announce this week the first continuous availability server for the Windows NT marketplace. The NT SMP ClusterServer incorporates NetFRAME's proprietary Gemini SMP symmetric multiprocessing technology, which provides processor mirroring capabilities. If one processor goes down, Gemini's auditing function takes

cator of the acceptance of the Microsoft platform for enterprise-level needs.

Compaq's ProLiant 4500, Hewlett-Packard Co.'s LH and LS SMP server lines, as well as Tricord Systems, Inc.'s PowerFrame servers support Windows NT, but none offer continuously available technology for NT.

Burris questioned whether NT users were looking for con-

tinuously available options from their hardware, but he said NetFRAME should have some success in certain vertical markets, such as telecommunications.

Based on shipments, NetFRAME had about a 3% share of the mid-range market in 1994, according to International Data Corp. (IDC) of Framingham, Mass.

©NetFRAME: (408) 474-1000.

## Remedy help desk hits Microsoft platform

By Jim Duffy

Mountain View, Calif.

Remedy Corp. last week became the latest network management vendor to jump on the Windows NT bandwagon by introducing a version of its help desk application for the Microsoft Corp. operating system.

The Action Request System (ARS) for Windows NT is the first version of Remedy's software to run on anything other than Unix. But like other management software vendors, such as Cabletron Systems, Inc., Computer Associates International, Inc. and IBM, Remedy is looking to capitalize on NT's growing popularity.

ARS for Windows NT includes a number of new features designed for the unique requirements of NT users, including interfaces to the NT

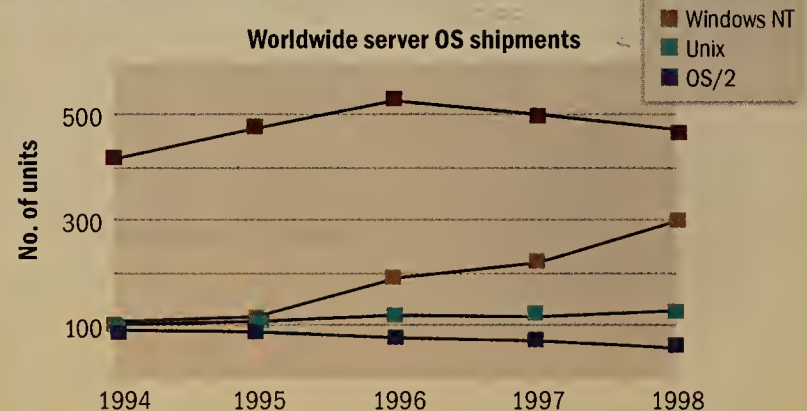
The new software works with ARS clients for Windows, Macintosh and Unix, and can also support Web browsers and electronic mail clients.

Still, some users are hoping for more from Remedy.

"They don't have a multi-server version" which would allow administrators to delegate specific help desk tasks to particular sites, said one user from a large computer manufacturer in Houston. "What I'm trying to do is an enterprise installation where I have a central ARS server that's accessed from about 50 different sites around the globe. That number of concurrent users — which is going to continue to grow up to around 150 — cannot be supported without a multiserver implementation."

The user said he had no commitment from Remedy that a multiserver implementation of ARS for Windows NT is in the cards. But a Remedy spokeswoman said this capability will be

## WINDOWS NT ROARS AHEAD



Shipments of Windows NT as a server operating system are expected to outpace Unix and OS/2 next year, and close the gap with NetWare.

GRAPHIC BY TERRI MITCHELL

SOURCE: FORRESTER RESEARCH, CAMBRIDGE, MASS.

event log and registry, support for Microsoft Mail servers and a choice of using Microsoft SQL Server or Oracle Corp.'s Oracle7 databases.

The product is backward-compatible with the Unix version, enabling customers migrating to the NT edition to import their existing data and application schemata into the new product, the company said.

in the next version of ARS for Windows NT, which she said is due out the first quarter of 1996.

In addition to the new version of ARS, Remedy introduced the ARS Administrator Tool for Windows.

ARS for Windows NT is available now for \$6,500. The administration tool comes bundled with the product.

©Remedy: (415) 903-5200.

## Database vendors tackle the Web

Company	Product plan	Availability
Computer Associates	CA-UniCenter/ICE management software for Web servers; CA-OpenIngres/ICE for Web-enabling OpenIngres databases	Now
Informix	Informix Web Interface Kits for writing CGI programs that can interface with Informix databases	Now, via Internet
Sybase	A tool called web.sql for integrating Web servers and Sybase databases; Java-based front-end development tools	Q1 1996 for web.sql; no date available for development tools

## Database companies begin rolling out slew of Web wares

By Barb Cole

Several database firms last week announced products for linking their databases and applications to the World-Wide Web.

Sybase, Inc. rolled out middleware for linking Web servers with both Sybase and non-Sybase databases, while Computer Associates International, Inc. (CA) took the wraps off an HTML-enabled database and Web management tools.

Informix Software, Inc. introduced interface kits for linking applications built with its development tools to Web servers.

Customers said the offerings will enable them to build more useful Web servers.

"Most of the Web stuff we've done so far has been built around Perl and [Common Gateway Interface], but we're moving that information to a relational [Sybase] database for greater control and better performance," said Robert Olsen, president of Virtual Vineyards, Inc. in Los Altos, Calif. The company sells wine and gourmet food via the Internet and will use Sybase's new web.sql tool to link the company's Sybase database with its Netscape Communications Corp. Web server.

### Sybase makes the connection

Sybase's web.sql middleware is designed to manage a live connection to a company's database so Web pages may be dynamically updated with current data. Web.sql may run on either the database server, the HyperText Transfer Protocol server or on a separate server.

The software includes Sybase's Open Client libraries, which let users access Oracle Corp. and IBM databases via Sybase's Enterprise Connect middleware. The firm will round out its Web offerings by building front-end development tools based on Sun Microsystems, Inc.'s Java software.

Sybase web.sql will ship in the first quarter for SunSoft, Inc.'s Solaris; versions for other operating systems are due in the second quarter. Pricing will range from \$1,200 to \$5,000, depending on the operating system.

### CA's Web plan

CA is focusing on the management of Web servers and creation of Web databases. The company announced an Internet Commerce Enabled (ICE) add-on to its UniCenter systems management software. It features automated recording of security breaches as well as monitoring of Web servers for errors and events. Intranet features include software distribution and configuration management, and the ability to group and define access rights.

In addition, CA has allied with Netscape under which UniCenter/ICE will be integrated with Netscape's Web servers.

UniCenter/ICE will be available in the first quarter, as will the Netscape and UniCenter joint offerings. The ICE technology, available on Unix and Windows NT, adds 15% to the price of a UniCenter server.

On the Web database development front, CA is delivering OpenIngres/ICE, a product that gives users HTML access to data stored in OpenIngres or other data sources via CA gateways.

OpenIngres/ICE will ship next month starting at \$16,000.

### Informix targets developers

Informix is putting its resources into new CGI kits designed for companies developing Web-based front-end applications. The free Informix Web Interface Kits will let users adapt new or existing Informix-4GL and Informix-ESQL applications to run over the Web.

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over, switching to another processor working on the same set of requests.

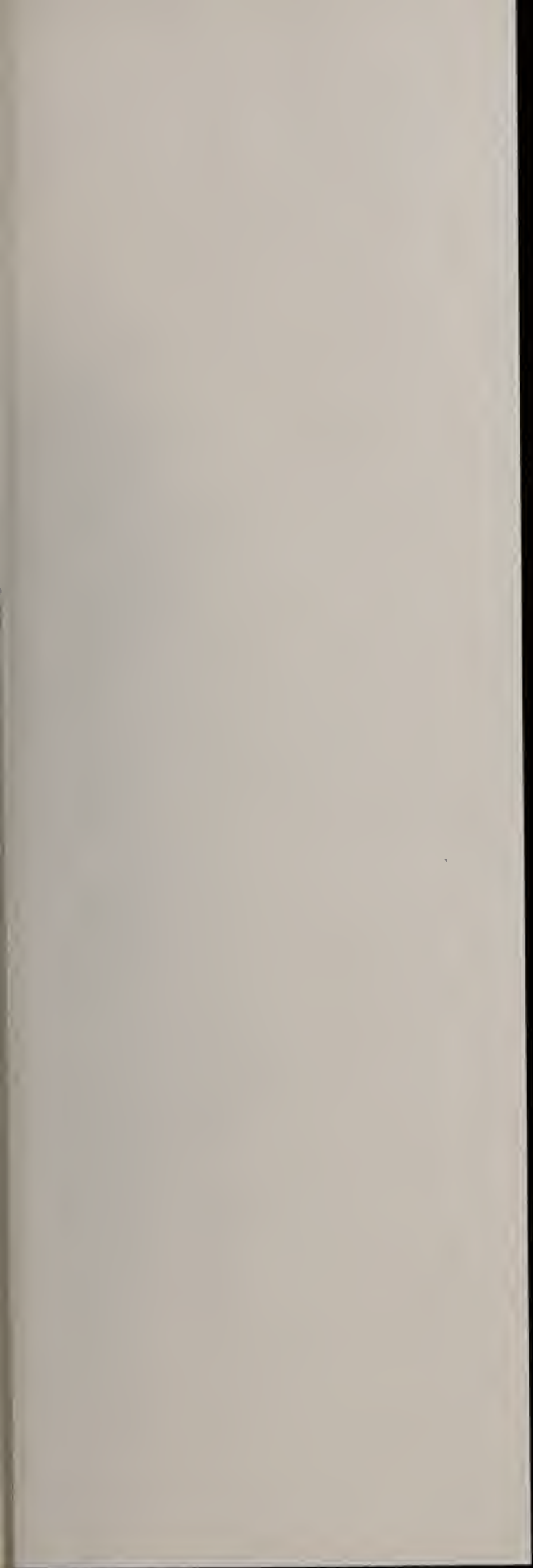
NetFRAME next week will also announce a ClusterServer optimized for Novell, Inc.'s GroupWise. GroupWise is Novell's electronic mail and groupware product.

The NT introduction comes at a time when Intel Corp's powerful Pentium Pro processors have blurred the lines between PCs and mid-range servers — also dubbed superservers. Analysts said the move is essential in order for NetFRAME to remain a viable player in the marketplace.

According to Peter Burris, an analyst with the Stamford, Conn.-based consultancy META Group, Inc., NetFRAME has to support Windows NT, offer a set of technologies that justifies a slightly higher price than competitors, such as the dominant Compaq Computer Corp., and do it without compromising NT's integrity as a NOS.

Burris said the merger between continuously available server technology — generally thought of as a feature for the high end of the PC market — and Windows NT is another indi-











# WANs & Internetworking

**Covering:** Network Architectures • Net Management • Mobile Computing  
Local/Long-Distance Services • Routers • Muxes and other CPE

## Briefs

■ **NEC America, Inc.** unveiled its *Desktop Receptionist*, a Windows 3.1 application using Microsoft Corp.'s Telephony Application Programming Interface to enable the user to make, answer and transfer calls using a PC.

Available now, it is supported by NEC's NEAX 2400 ICS and 2000 IVS private branch exchange systems.  
NEC: (800) 832-6632.

■ In an effort to encourage wireless data use, modem maker Motorola, Inc. and its **ARDIS Co.** wireless network company are offering special deals on the Motorola Personal Messenger 100D wireless modem.

Reseller discounts should reduce the cost of the device to the end user from about \$700 to around \$400 through March.

■ Last week, **Visual Networks, Inc.** announced *Visual UpTime*, a network management system for frame relay networks. It consists of console application software to interpret data collected by an analysis service element (ASE) embedded in a DSU/CSU and providing the functions of a protocol analyzer, transmission monitor and DSU/CSU. The software runs under Microsoft Windows; a Unix version is planned for 1996.  
ASE pricing starts at \$1,395; the console application pricing starts at \$4,995.

■ **Lantronix** has unveiled a protocol analyzer specifically for troubleshooting multiple network segments configured with Ethernet switches. Lantronix Network Analyzer (LNA) allows network managers to monitor several LAN segments simultaneously to pinpoint the source of network problems, according to the company.

The two-port LNA2 costs \$2,995, and the six-port LNA6 costs \$3,995.

Lantronix: (800) 422-7015.

## Atlanta's transportation future is now

By Michael Cooney  
Atlanta

It's going to take an Olympian effort and a gold-medal network to keep the traffic moving in and around the city here during the Olympics next summer.

The Georgia Department of Transportation (GDOT) and a contingent of subcontractors are building the Atlanta Regional Advanced Traffic Management System (ATMS). This system includes software and an ATM-



Atlanta 1996

based network that is not only designed to handle the anticipated crush of highway traffic expected at next summer's Olympic games, but also to be a model transportation system for the rest of the U.S.

"Much of this system wasn't supposed to be put into place until the year 2000, but with the Olympics, the state moved the project up a bit," joked David Spiney, IS manager and chief designer of the ATMS. "It's an overwhelming project, really, but once it's completed, it will be a model system well into the next century."

The city is bracing for a possi-

ble fivefold increase in traffic, added Annette Posey, project manager for information transfer systems at Milcom Systems Corp., one of the systems integrators involved in the ATMS project. "We are looking to prevent the kind of transportation gridlock that kind of increase could bring, plus, in a bigger scope, find ways for America's larger cities to handle explosive automotive traffic growth."

The federal government is also watching—the Department of Transportation kicked in \$58 million to help the project, which it views as a possible solution for gridlocked cities such as Los Angeles and Boston.

Here, the ATMS project entails building five Traffic Con-

trol Centers (TCC), one in each of the city's surrounding counties, and a new central Transportation Management Center (TMC) in downtown.

The new TMC will be linked  
See Atlanta, page 16

## Inacom joins managed frame fray

By David Rohde  
Omaha, Neb.

How would you like some PCs, modems, printers, laptops... and a little frame relay on the side?

That's the pitch users could hear from their value-added resellers and systems integrators, as one of the nation's largest such companies — Inacom, Inc. — prepares to enter the frame relay business.

The firm later this month is expected to announce a managed frame relay offering in partnership with a major carrier, leaping into a field already crowded with offerings from outsourcing firms and the carriers themselves.

Inacom's service will be "a fully managed network offering" with full-time monitoring of customer premises equipment from a network control center, according to Bob Puissant, Inacom's vice president of marketing and business development here.

Besides frame relay, Inacom will offer other data transport options, such as fractional T-1 and switched 56K bit/sec digital service, Puissant said. The initiative is designed to leverage Inacom's expertise in setting up

See Inacom, page 23

## Cisco plans to manage switched internetworks

By Jim Duffy  
San Jose, Calif.

Cisco Systems, Inc. last week unveiled an architecture for managing switched internetworks that integrates new and existing applications into a single offering.

CiscoWorks for Switched Internetworks comprises applications for configuring virtual LANs, monitoring switch traffic and managing Cisco routers. It also includes agent software on the managed devices that supports Cisco's Discovery Protocol (CDP) for collecting topology information and the Remote Monitoring (RMON) Management Information Base, as well as probes for analyzing switches and switch links.

CiscoWorks for Switched Internetworks ties together the company's CiscoView, VLAN-Director and TrafficDirector applications. CiscoView provides graphical management of network devices, while VLANDirector enables drag-and-drop configuration of VLANs. TrafficDirector, meanwhile, provides graphical monitoring of network behavior.

The applications in Cisco-

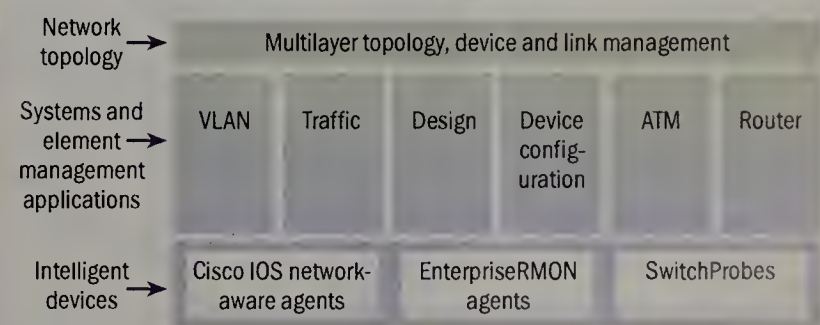
Works for Switched Internetworks gather topology and traffic management information from devices that are equipped with the CDP or RMON agent software.

launched from the CiscoView screen for applying RMON agent options to an individual port or group of ports.

Analysts say CiscoWorks for Switched Internetworks goes beyond what Cisco rival Bay Networks, Inc. can deliver.

"With Bay, you can set up VLANs within a [LattisSystem] 5000 [switching hub] or within boxes like the [LattisSwitch] 28115," said John Morency, prin-

### THE CISCOFUSION MANAGEMENT FRAMEWORK



CiscoWorks for Switched Internetworks comprises an integrated suite of switch management applications plus embedded network agents.

GRAPHIC BY TERRI MITCHELL

Once the topology map is configured, users can point and click on a specific node to bring up a CiscoView depiction of that node's status.

Switch ports represented by CiscoView can be dragged into the VLANDirector configuration windows for establishing logical links between nodes. TrafficDirector also can be

cial at The Registry, Inc., a Newton, Mass., consultancy. "But you can't mix and match VLANs across the two."

Bay officials, however, claim that they can group ports from these switches into a VLAN.

CiscoWorks for Switched Internetworks costs \$7,995 and will ship in the first quarter.

©Cisco: (408) 526-4000.



## Mobile computing

# RadioMail broadcasts its wireless message to masses

By Joanie Wexler

Boston

RadioMail Corp. is delivering its wireless two-way messaging, fax and information access offerings to mainstream America by extending those services to cellular and dial-up links.

Cellular bigwigs Ameritech Cellular Services and GTE Mobilnet, Inc. have signed on to bundle and resell RadioMail's suite of services with their circuit-switched cellular, Cellular Digital Packet Data (CDPD) and paging offerings. Getting simple data applications, such as RadioMail, running over the ubiquitous analog cellular network could help initiate the masses into wireless data.

"This is definitely a good sign. It shows that at least some CDPD operators have not completely abandoned the horizontal markets to chase delivery vehicles and field service workers," said Bill Frezza, president of Wireless Computing Associates, a consultancy in Yardley, Pa.

RadioMail also announced a message

management tool called RadioMail Remote Control Services. Expected to be available in the first quarter, the offering addresses users that want to control when and how messages are sent and received as a way to temper network usage costs.

The system also lets users connect to their RadioMailBox over a cellular net and forward incoming messages to a fax machine, commercial on-line mail address or corporate electronic mail system.

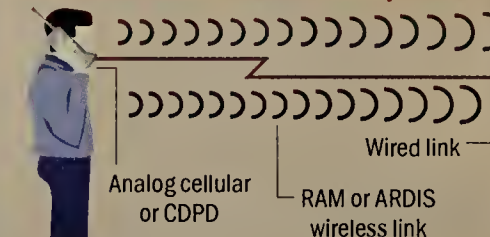
One criticism of RadioMail in the business world has been its inability to connect to corporate E-mail systems, creating the inconvenience of having multiple mailboxes to maintain.

Remote Control Services carries a flat monthly fee of about \$10, with connect-time charges of 20 cents per minute.

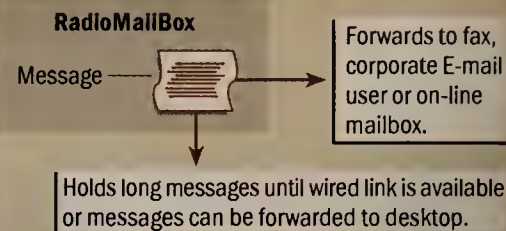
To further manage messages and costs, customers also can receive a summary of all incoming messages on a pager and determine which need to be read immediately and which could be read later — for instance, over a wired link — to avoid air-

## RadioMail broadens its appeal

### RadioMail adds new access options...



GRAPHIC BY TERRI MITCHELL



...and message management capabilities.

time fees. Users also can program their mailboxes to forward large messages to a desktop system.

RadioMail is both a messaging and gateway service that allows users to send and receive messages, faxes and pages among a variety of networks, including the RAM Mobile Data and ARDIS Co. packet radio nets and the Internet. The wireless support is aimed primarily at individuals who need to be in touch with other network users but are on the go and not always near a phone jack.

However, RadioMail until now has been largely limited to the national ARDIS and RAM networks — as well as

some regional nets — that are well known to business customers with field service, transportation and other vertical applications. But those nets have not been household names, and, even in their niches, coverage sometimes proves inadequate.

So individuals using RadioMail have been unable to check or send messages when they wander into an area where there is no coverage by ARDIS or RAM. Now, however, they can default to a cellular or a wired link in those situations, or use a cellular link as their primary method of communication and use a wired link when near a phone jack to save on connect-time charges. ■

## Atlanta

Continued from page 15

to GDOT headquarters and the existing Atlanta TCC on a 620M bit/sec OC-12 SONET ring supplied by AT&T. That ring will be connected to a regional 155M bit/sec ATM network comprising Bay Networks, Inc. LattisSystem 5000 ATM switches, which will link the TCCs, Georgia Public TV and the Metropolitan Atlanta Regional Transportation Authority (MARTA) transit system.

All the city's main interstates and secondary roadways will be equipped with ramp metering signs, electronic message displays, cable TV cameras, auto detectors and traffic signal monitoring devices that will be daisy-chained to send and receive data from the TCCs. In turn, the TCCs will use RAD Data Communications, Inc. Megaplex 2000 multiplexers to funnel the data onto the fiber-optic ring, according to Posey.

Spinney added that the project is about 60% complete outside the TMC, and the TMC itself is about 80% done. The project is expected to be completed by March.

"Laying some 150 miles of fiber and constructing the buildings are the primary challenges to this product," Spinney said. "Getting the networking and other computer vendors to rigorously help us build what amounts to a leading-edge enterprise is the other challenge."

Many of the projects' core technologies aren't quite available yet.

For example, the ATM interface on Bay's LattisSystem 5000 is not available, and the project's primary software — an expert system built by GDOT, TRW, Inc. (the prime contractor) and others — is still coming together. ATMS applications are built using C++ and are all object-based and POSIX-compliant so that they may be ported to run on any of the project's Hewlett-Packard Co. or Sun

Microsystems, Inc. servers.

Once the project is completed, GDOT will own the software outright.

Once in place, the ATMS can measure a number of traffic-related activities and send and receive data and video in milliseconds. For example, embedded ramp and highway meters pass car counts to the TMC and ATMS applications continuously. Special video cameras can watch



Milcom's Posey says the ATMS project is aimed at reducing traffic gridlock.

individual lanes on the highway and determine volume, speed or even if a driver is going the wrong direction. The application will generate an alert if any of these monitored features reaches above a prescribed threshold.

As a result, operators can quickly post warnings on electronic signposts beside highways or change the timing of signal lights to handle increased volume. Alerts also can be transmitted to local radio and TV stations.

Cameras also can alert emergency crews to accidents much faster, Posey said. For each minute saved clearing an accident, 10 minutes can be saved in traffic tie-ups and up to 33 incidents may occur per hour during the games, Posey said.

MARTA will have access to the ATMS system, enabling bus drivers to avoid congested areas or radio in accident reports.

And finally, the ATMS will get a home page on the World-Wide Web so that users coming into the area can dial in and plan alternate routes into the city before becoming part of the congestion. ■

Good luck finding the chapter  
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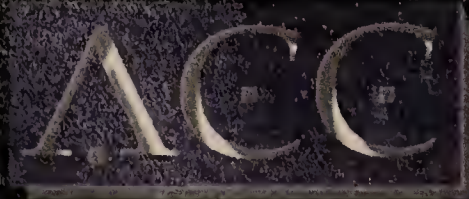
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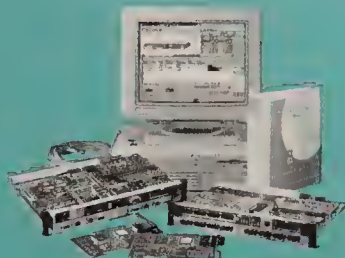


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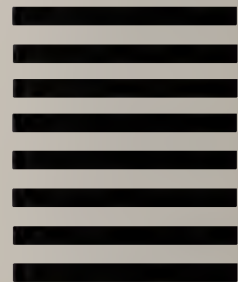


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## INTERNETWORKING MONITOR

### The value of sure and obscure packets

**T**wo weeks ago, Patrick Bird wrote an article for this paper about the use of packet-level encryption (Nov. 27, page 45), but he failed to mention the work of the Internet Engineering Task Force (IETF) in this area.

In August, the IETF published five security-related Proposed Standards as RFCs. These documents are products of the IP Security Working Group within the IETF. They provide an overview of a security architecture for IP (RFC-1825), descriptions of a packet authentication extension to IP (RFC-1826), a specific authentication mechanism (RFC-1828), a packet encryption extension to IP (RFC-1827) and a specific encryption mechanism (RFC-1829).

Support for these security features is mandatory for implementation of the next generation of IP (IPv6), which claims to be standards-compliant. They are optional for the current version of IP (IPv4) used on the Internet and in private IP networks.

Authentication is used to ensure that the receiver of information transferred across a network knows that the origin of the information has not been forged and that the information itself has

not been modified during travel.

There are many applications in which confidentiality is not required, yet it is quite important to be able to verify that the data is legitimate — for example, the routing updates within the Internet. The information that is carried (namely, the location of individual networks attached to the Internet) is not secret, but it could be quite disruptive if someone deliberately inserted false information.

At other times, the information itself should be kept hidden — for example, when transferring credit card numbers from a buyer to a merchant. The encryption extension is used in these cases.

Some people would claim that performing these types of security functions at the packet level is wrong since application-level security is far more efficient than at the packet level. It is clearly better in terms of the amount of data transferred if an application can support authentication and/or encryption on its own, but the presence of packet-level security permits the use of security-ignorant applications in a secure way.

One area requiring additional effort is key management. To use any security, both ends of an electronic conversation must agree on the security methods and the encryption keys for a particular interaction. Frequently, the key exchange is the weak link. The IETF IP Security Working Group is working on key exchange systems and expects to propose one soon.

The IETF security functions can be

done using separate external devices, as Bird described, by the Internet firewalls or by using software installed on the end systems themselves.

A number of prototypes currently are running, and IETF security features soon

should be available commercially.

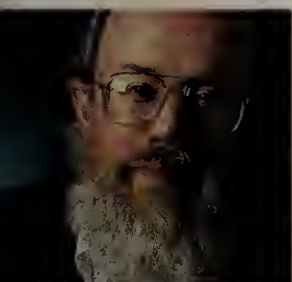
The widespread ability to support authenticated and confidential exchanges over private data networks and the Internet is critical to the future growth of electronic commerce. Packet-level security will be a key enabler in this area.

RFCs can be retrieved by using anonymous FTP from ds.internic.net in the directory RFC. The file name for RFC-1825 would be RFC1825.txt. A URL for

the RFCs is <http://www.internic.net/ds/dspg1intdoc.html>.

*Disclaimer: While many of the people at Harvard are quite sure of themselves, they are not so sure about others, so authentication could be useful, but these are my own opinions.*

*Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached via the Internet at [sob@harvard.edu](mailto:sob@harvard.edu), or at (617) 495-3864.*

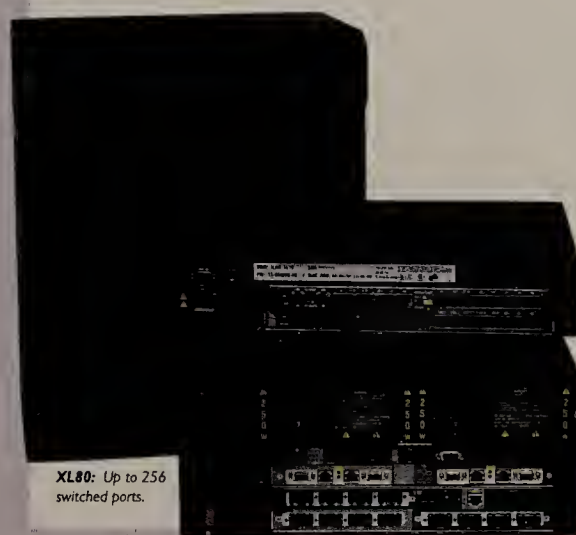


Scott Bradner

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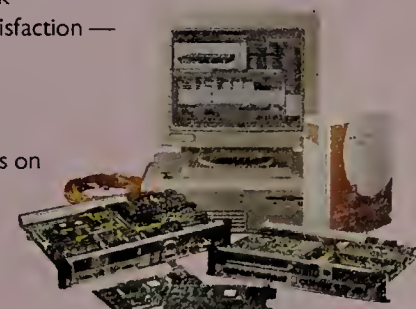
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## Business Briefs

**Cisco Systems, Inc.** of San Jose, Calif., has acquired a minority stake in network management vendor **Objective Systems Integrators, Inc. (OSI)** of Folsom, Calif.

Cisco acquired 1.3 million shares of OSI at \$19 per share for an effective 4.4% stake in the company. Cisco and OSI plan to codevelop network management applications for Cisco's internetworking technology, which will enable service providers and large companies to quickly deploy new internetworking services over their networks, the companies said.

This week, **Motorola, Inc. and Shiva Corp.** will announce a joint development agreement to meld Shiva's remote access technology with Motorola's 925 System remote access server.

One of the results of the arrangement will be a 925 system that provides high-volume analog and ISDN call termination with remote LAN connectivity and increased security, according to the companies. Motorola will market the product to carriers, Internet service providers and large corporate customers.

This product and others resulting from the relationship are expected to be available in the first quarter.

# Sprint offers to manage customer E-mail networks

By David Rohde  
Boston

Sprint Corp. recently introduced a managed service under which the carrier will translate between multiple electronic mail formats and provide message transport across the wide area.

The InfoXchange service, based on a hub designed by Control Data Systems, Inc., is targeted at large corporations and government agencies seeking to unify heterogeneous messaging systems. Available now, it is likely to emerge as yet another good application for frame relay at speeds anywhere from 56K bit/sec to T-1.

Sprint officials at the EMail World & Internet Expo here declined to reveal full pricing for the service, but implementation is likely to be fairly expensive. Users must first pay for a complete enterprise internetwork plus around-the-clock management from Sprint of the entire setup. Usage charges for each message are additional (see graphic).

InfoXchange runs over a variety of Sprint's network offerings. But frame relay will probably be the most prevalent choice, with the carrier's SprintLink IP service the No. 2 option, said Joan Potter, national manager for sales and support of messaging services at the carrier.

In addition, InfoXchange will work over the SprintNet X.25 public packet network.

Although E-mail applications over the wide area typically have required only low-speed frame relay networks, a couple of customers already have requested T-1

### Pay as you E-mail

#### Usage charges per message for Sprint's InfoXchange service:

First kilocharacter:  
30 cents

Second through 39th kilocharacter:  
5 cents each

Each additional kilocharacter:  
2 cents each

There are added charges for network services and management.

At the hub site, Control Data has built gateways for 22 of the most popular E-mail offerings. When a message arrives over the network, the destination address is matched with information on the destination user's E-mail system stored in an X.500 directory system. The message is translated into that system's format and shipped out to the user.

Since InfoXchange runs over router-based network services, E-mail destined for another user at the same site does not go out over InfoXchange. It is delivered as usual over a LAN without incurring a usage charge, Potter said.

By the middle of next year, Sprint hopes to extend the service beyond managed networks for individual companies and offer it as a straight public network offering, Potter said.

CompuServe, Inc. and Infonet Services Corp. both offer similar services over their networks.

CompuServe Mail Hub lets users dial in locally to the CompuServe network to pick up and drop off mail at a post office for \$17.95 per hour. Infonet's Notice Xchange also allows users to dial in to a managed post office that connects dissimilar E-mail packages.

Sprint: (800) 736-1130.

Senior Writer Tim Greene contributed to this story.

Advertisement

## Why consider an ATM-based internetwork?

By Joe Skorupa



In backbone network planning, ATM is all too often positioned as a large pipe between clients on LAN switches and ATM-attached servers. A properly designed ATM-based internetwork is "smart" and offers much more.

### Consistent Performance

As interactive, network-based applications become mission-critical, response time must remain low and predictable. Order entry applications cannot suffer because someone decided to print high-resolution color images. Only ATM's connection-oriented communications reserves bandwidth for crucial applications, and dynamically allocates any remaining bandwidth to other applications.

### Efficient Security

Every organization wants its users to have the fastest possible access to data that resides on the internetwork. But, it must also protect that data from access by unauthorized individuals. Some organizations implement router-based access control schemes to restrict access. Unfortunately, routers must examine every packet, reducing throughput by as much as 90%. With ATM, only the first packet of an application's session (e.g., remote login or file transfer) must be examined. This allows

ATM-based internetworks to offer comprehensive access control without sacrificing performance. In fact, throughput on such networks can approach full line rate.

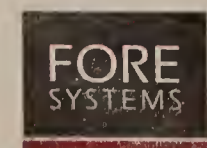
### Network Management and Capacity Planning

An added benefit of ATM's connection-oriented approach to internetworking is the ability to intelligently manage network growth. Each ATM connection record provides a transaction-oriented view of the network, generating detailed network usage reports. It shows who is using the network and when, the applications used, and the traffic generated. These records allow network managers to assess the impact of adds/moves/changes.

Other vendors claim ATM-based internetworks will provide these valuable services once everyone rewrites their applications to accommodate ATM to the desktop. However, we believe these capabilities are needed, today. Only the *ForeThought* ATM Internetwork Architecture delivers these advanced capabilities to existing applications

now—without re-writing them—even when users access the internetwork from conventional switched LAN connections.

**For a copy of the White Paper**  
***ForeThought and the ATM Internetwork*,**  
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## More 'Net nodes laid as Cable & Wireless gives global access

By Tim Greene  
Vienna, Va.

Joining other global Internet access providers, Cable & Wireless PLC recently announced that it will install eight access points worldwide to provide up to 34.3M bit/sec access as well as more efficient routing.

That gives international users another choice for overseas points of access to the Internet and more direct delivery of traffic among overseas sites in the same region.

Eventually, the eight sites (see graphic) will be meshed regionally, reducing expensive transoceanic traffic — savings that could be passed along to users.

The nodes probably will not mean much in terms of network speed, according to Tim Wilson, a senior consultant for Decisys, Inc., a consultancy in Sterling, Va.

The new nodes will reduce the number of hops that traffic makes before reaching its destination. But most latency actually comes from the speed of users' access and the speed of the server being contacted, not from router-to-router transport speed, Wilson added.

The Cable & Wireless regional routing effort parallels one announced earlier this year by Sprint International (NW, Oct.

### NEW NODES

Cable & Wireless PLC is creating eight overseas Internet access points that enable the routing of some traffic without first having to send it to traditional routing points.



23, page 1), which includes nine international nodes.

The similarity between the two lies in being able to route regional traffic without relying on U.S. routing points.

Cable & Wireless Internet Exchange (CWIX) is scheduled to go on-line May 1, with individual sites being phased in before then. It will offer access at speeds up to E-3 (34.3M bit/sec).

The infrastructure for the network includes routers from Cisco Systems, Inc. and multiplexers from Newbridge Networks, Inc.

Also recently, Cable & Wireless and some of its subsidiaries announced new Internet access packages that will be available over CWIX.

They include U.K.-based Mercury Communications, Ltd. and Hong Kong Telecom. ■





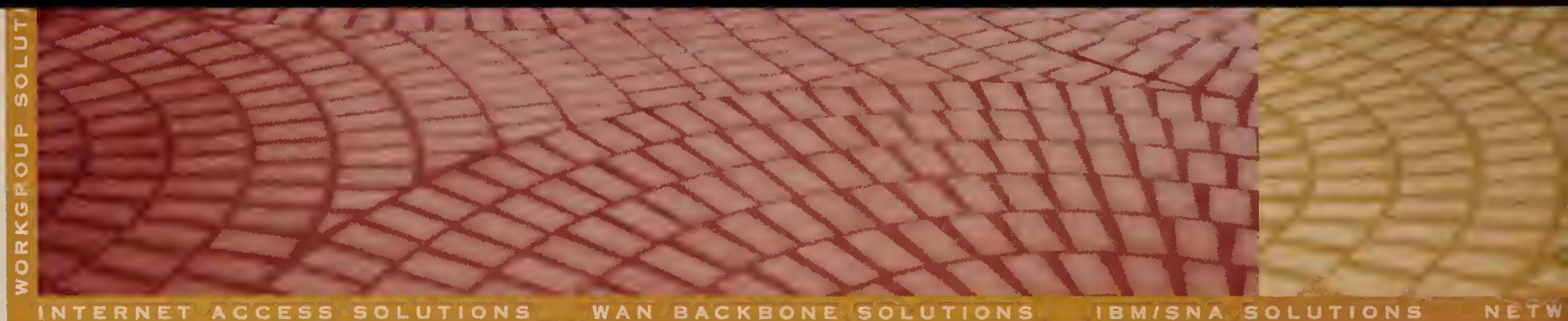
How well does your  
network let you perform  
these functions?







Does it let you add and  
and networking functions  
you need



INTERNET ACCESS SOLUTIONS WAN BACKBONE SOLUTIONS IBM/SNA SOLUTIONS NETWORK

\*Customer must submit registration card for lifetime warranty to apply. Advance hardware exchange available during first year; thereafter return hub to 3Com. Power supply and fan warranted for one year only. Lifetime





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warranty not offered where prohibited or restricted by local law.



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SuperStack gives you the flexibility to grow. Let's say you start simply by adding the LinkBuilder® FMS™ II. You'll be getting more than just the industry's top-selling stackable hub. You'll be getting modular functionality, a lifetime warranty,\* and true stackable flexibility. You can continue to add technologies such as Fast Ethernet and networking functions such as switching and routing so you'll be able to build and re-build as the need arises. Combine all this with 3Com's® EtherLink® adapters, and you'll have the best workgroup that money can buy.

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NETWORKS THAT GO THE DISTANCE



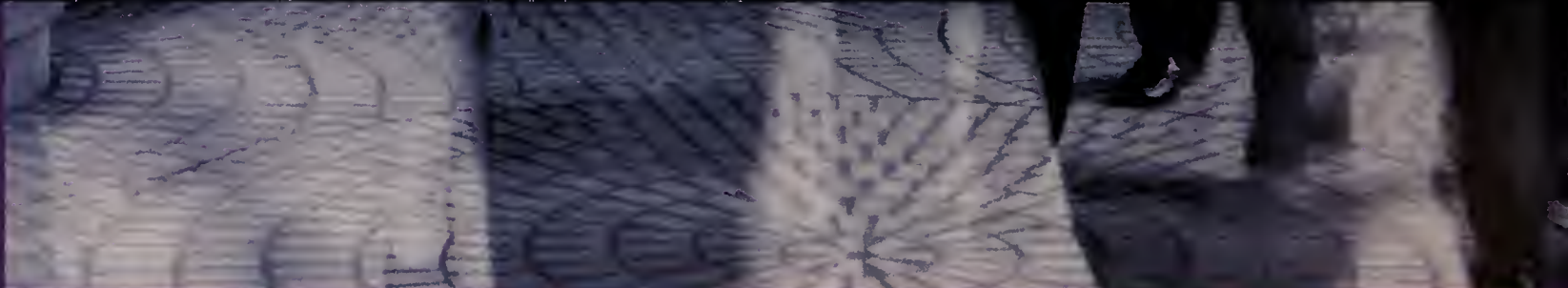
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performance by giving you afford  
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\*Dollars are in U.S. currency.





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Thanks to our unique ASIC technology, with any of our Ethernet, Fast Ethernet and Token Ring LinkSwitch solutions, you'll have the speed to boost throughput and prevent bottlenecks in your LANs with a choice of connecting your servers to Fast Ethernet, FDDI or ATM. The flexibility to match specific configurations and to manage it all from your desktop with our Transcend management software. The reliability of being able to back up with our Redundant Power System. And the security of knowing that 3Com is the leader in network solutions for workgroups. There you have it. Performance, affordability, reliability. When it comes to the 3Com SuperStack system, you do the math.





FDDI SOLUTIONS FAST ETHERNET SOLUTIONS BUILDING/CAMPUS SOLUTIONS HOME OFFICE

STACKABLE SOLUTIONS REMOTE ACCESS SOLUTIONS SWITCHING SOLUTIONS



Does it let you divide your  
capabilities among your remote  
having to increase support

WORKGROUP SOLUT



INTERNET ACCESS SOLUTIONS WAN BACKBONE SOLUTIONS IBM/SNA SOLUTIONS NET





network's  
sites without  
staff?



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What you'll be getting is more control and more flexibility. Installation and configuration are plug-and-play and integration is smooth with central office resources. With our Transcend management software, you'll be able to manage everything from a centralized location. You can even add the reliability of backing up with our Redundant Power System. And since 3Com is a networking leader, you can count on service, support and reliability. So there you have it. Functionality, control, reliability. When it comes to the 3Com SuperStack system, you do the math.







## SuperStack products at a glance

(For a closer look, call 1-800-NET-3Com)

### HUBS

3Com's industry-leading wiring hubs bring proven performance to a stack. Optional slide-in modules are available for network segmentation and advanced management functionality.

#### Ethernet

- LinkBuilder FMS II TP (12- or 24-port)
- LinkBuilder FMS II Fiber
- LinkBuilder FMS II Telco
  - LinkBuilder FMS II Management Module
  - LinkBuilder FMS II Bridge Management Module
  - LinkBuilder Bridge MicroModule

#### Fast Ethernet

- LinkBuilder FMS 100
  - LinkBuilder FMS 100 Base TX Transceiver Interface Module
  - LinkBuilder FMS 100 Base FX Transceiver Interface Module

#### Token Ring

- LinkBuilder FMS TR (12- or 24-port)
  - LinkBuilder FMS TR RMON Management Agent Module
  - LinkBuilder FMS TR Advanced RMON Management Agent Module
  - LinkBuilder FMS TR Fiber RI/RO Module
  - LinkBuilder FMS TR Copper RI/RO Module
  - LinkBuilder FMS TR Copper/Fiber RI/RO Module

### SWITCHES

Switches boost performance in Ethernet LANs with a choice of Fast Ethernet, FDDI or ATM connections.

#### Ethernet

- LinkSwitch 500 (Ethernet only)
- LinkSwitch 1000 10-100 (Ethernet to Fast Ethernet)

- LinkSwitch 1200 (Ethernet to FDDI)
  - LinkSwitch MSH Module
- LinkSwitch 2200 (Ethernet to FDDI)
- LinkSwitch 2700 (Ethernet to ATM)
- LinkSwitch 3000 (Fast Ethernet)

#### Token Ring

- LinkSwitch 1000 TR (TR only)
  - LinkSwitch 1000 TR FDDI Module
  - LinkSwitch 1000 TR TM Module

### REMOTE ACCESS SERVERS

Remote access servers extend full network access to remote users dialing into remote office and workgroup LANs.

#### Ethernet

- AccessBuilder 2204 (4 port)
- AccessBuilder 2208 (8 port)

### ROUTERS

Low-cost, high-functionality routers simplify remote site connections.

#### Ethernet

- NETBuilder Remote Office 221 (BR)
- NETBuilder Remote Office 222 (IP, IPX)
- NETBuilder Remote Office 223 (SNA) (BR)
- NETBuilder Remote Office 224 (IP)
- NETBuilder Remote Office 227 (all protocols)
- NETBuilder Remote Office 228 (connection services)

#### ISDN

- NETBuilder Remote Office 421 (BR)
- NETBuilder Remote Office 422 (IP, IPX)

- NETBuilder Remote Office 423 (SNA) (BR)
- NETBuilder Remote Office 427 (all protocols and WAN services)
- NETBuilder II WAN Extender 2TI
- NETBuilder II WAN Extender 2E1

### SDLC Converters

SNA-to-LAN converters cost-effectively link remote offices to the SNA host system.

#### Ethernet

- LinkConverter™ 250
- LinkConverter 251

#### Token Ring

- LinkConverter 350
- LinkConverter 351

### REDUNDANT POWER

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#### Redundant Power System (RPS)

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Transcend WorkGroup Manager for NMS  
Transcend Enterprise Manager for Windows

Transcend Enterprise Manager for UNIX (supports HP/Open View, IBM NetView for AIX, SunNet Manager)



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# IBM to sharpen its ATM picture in 1996

*Nways Model 200 could ship in the first quarter.*

By Michael Cooney  
Raleigh, N.C.

IBM is aiming to make 1996 a very good year for ATM.

Executives last week detailed how some of the company's core Asynchronous Transfer Mode and switching products — including the long-awaited Nways Model 200 and software that will implement IBM's Switched Virtual Network (SVN) architecture — will roll out during the calendar year.

One of the key components to the migration of existing nets

is Nways 2220 Model 200, which IBM said will be announced in January and made available in early 1996, possibly by the end of the first quarter. The Model 200 will have six slots that can support a variety of local- and wide-area ports and will be positioned as a feeder node to larger ATM-based backbones. It will be the first IBM Nways product to support LAN-attached devices and an integrated router function (NW, Feb. 20, page 1).

The Model 200, as well as IBM's larger Models 300 and

500, will also get Multiprotocol Switched Services (MSS) support by the end of the year. MSS is the key feature of IBM's ATM soul, Network BroadBand Services. NBBS is the central controlling entity, setting everything from virtual LAN connectivity, load balancing and bandwidth requirements to congestion control.

MSS will control the routing and bridging functions of periphery devices such as routers and switches, as well as the traffic control and congestion management of the backbone switching components.

"The key to SVN success is getting the MSS and NBBS functions in the major IBM connectivity components in 1996. But based on IBM's current deliverable rate, that isn't likely to really happen until 1997," said Anura Guruge, an independent analyst based in New Ipswich, N.H.

Also expected in mid-1996 will be support for wide-area ATM on the larger Nways Model 300 and 500 boxes. Both currently support only frame relay interfaces.

Steve Simon, planning manager for IBM's advanced routing products, said IBM will add support for OC-3 trunks and ports to the switches in early 1996, possibly by the end of the first quarter.

IBM has a lot of money and research and development in its

puter telephony applications.

Inacom's moves could lead other companies with expertise in LAN installations to move deeper into building complete corporate internets, including wide-area transport.

"I think it's just so tempting because a lot of people are experiencing lower margins in just selling the hardware," said Arnie Tomaino, senior industry analyst with the Network Integration and Support Services program at Dataquest, Inc.

Inacom is likely to find its first takers among its existing base of customers, Tomaino said. Other users are unlikely to seek out the company's service, he added, since so many other vendors — including new entrants such as disaster recovery king Comdisco, Inc. — already are putting offers on the table.

It was unknown last week which carrier Inacom would use to obtain wide-area transport for its new data offerings. Resale of AT&T voice services has been a natural, since Inacom sells so much AT&T telephone equipment, said Gary Ferguson, Inacom's director of finance. But Puissant hinted that the data services will be provisioned through an AT&T competitor. ■

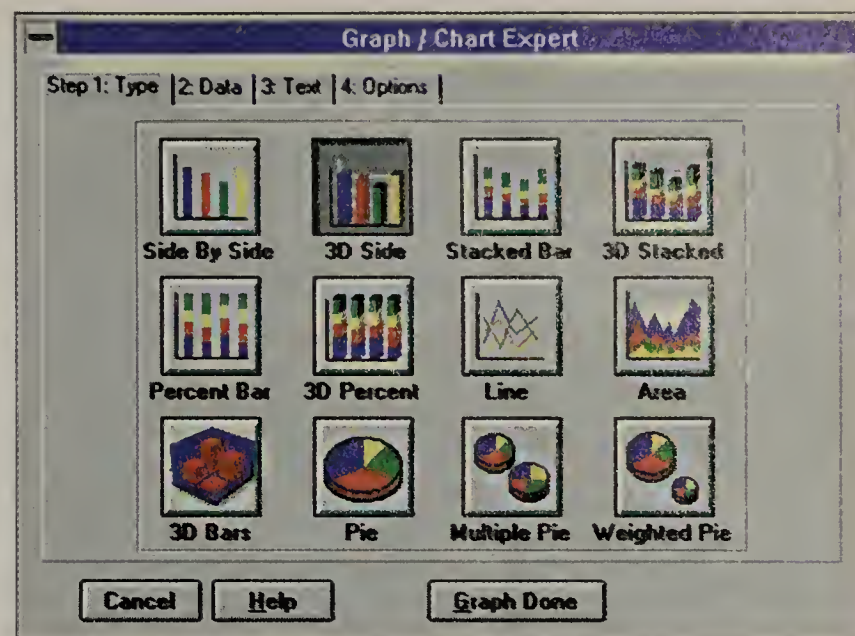
## WHAT'S COMING DOWN IBM'S ATM PIKE IN '96

- ▶ Nways 2220 Model 200 backbone switch
- ▶ Nways 2220 support for WAN ATM
- ▶ Nways Workgroup ATM switch
- ▶ Multiprotocol Switched Services in its Nways and LAN switches, as well as its LAN adapters

ATM product line, and has pretty much bet the networking farm on its success. How effectively it rolls the major components out is a barometer for how the networking systems business will survive in the next couple of years, analysts said.

"IBM wants ATM to be a success story in 1996," said Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J. "While it has insightful ATM technology, it has an insipid mechanism to deliver the message, so it will be a battle."

"The move to ATM is a little slower than we expected two years ago, but all indications are that about 90% of our customers will deploy ATM in some fashion in the next two years," Simon said. ■



Aspect's ReportWriter software utilizes a Graph/Chart Expert box, the equivalent of a Wizard, to enable users to choose their preferred kind of presentation.

## Aspect puts OLE and ACD to work on call center reports

By David Rohde  
San Jose, Calif.

A leading supplier of automatic call distributors has combined OLE with its own ACDs' connectivity to LANs and WANs to create a new reporting application equally accessible to managers inside and outside the call center.

The new CustomView ReportWriter and ReportRunner from Aspect Telecommunications, Inc. enables users to combine tracking data on 800 calls with information from enterprise databases and present them in the text and graphical formats of their choice.

Since ReportWriter is an OLE 2.0 container application, users can import OLE objects such as graphics and edit them within ReportWriter, liberating call center reports from the frozen formats typically imposed by ACD manufacturers.

Using a Wizard-like module within the Windows-based ReportWriter, users can choose among graph, bar chart, pie chart and three-dimensional presentations (see screen shot).

ReportRunner is a separate Windows client application that allows users to run reports that were designed using ReportWriter. Users can run these reports in real time or according to a prearranged schedule. The ReportWriter application includes all the capabilities of ReportRunner, as well.

The Ethernet connectivity and TCP/IP support provided by the Aspect CallCenter ACD allows users to grab information for their reports from any database supporting Open Database Connectivity (ODBC), including data thrown off by Aspect's own

Agility Release 2.0 interactive voice response system.

The ODBC support was particularly important when Dow Jones & Company, Inc. selected ReportWriter and ReportRunner for *The Wall Street Journal's* nationwide call center in Chicopee, Mass. The Aspect applications are enabling Dow Jones to streamline 15 to 20 reports per day into five to 10 reports, while integrating information from its IBM mainframe customer database, according to Jim Clancey, circulation voice systems administrator.

### A calculating move

The ODBC support also will enable call center administrators to solve the problem of paying agent commissions according to the revenues they generate from an initial contact, said Maribeth Lazich, Aspect product manager.

As long as the sales information is housed in an ODBC-compliant database — even if located outside the call center — a single report run can produce the commission calculations, Lazich said.

Reports generated by ReportWriter and ReportRunner can be delivered through E-mail systems that support Microsoft Corp.'s Messaging Application Programming Interface, notably Microsoft Mail, or Lotus Development Corp.'s Vendor Independent Messaging, notably cc:Mail.

Available in January, ReportWriter will cost \$7,995 and ReportRunner will be priced at \$1,995. Each includes a portfolio of templates developed by Aspect for often-requested reports.

©Aspect: (800) 597-5277

## Popular AT&T service resold by integrator

### Business-day rates for the new Inacom SDN Service:

Dedicated access to dedicated access locations:	6.6 to 14.0 cents per minute
Dedicated access to switched access locations:	11.7 to 19.0 cents per minute
Switched access to switched access locations:	17.6 to 22.8 cents per minute

Calls are rated in 6-second increments with an 18-second minimum. Volume and term discounts of up to 15% are available. Charges for calls beyond 3,000 miles may be higher.

GRAPHIC BY TERRI MITCHELL

## Inacom

*Continued from page 15*

LANs and help it expand beyond the LAN ports of bridges and routers, he added.

For some time, Inacom has resold switched long-distance service to the tune of \$20 million a year, primarily due to requests from small and midsize customers, Puissant said.

To beef up that side of the business, the company last month filed with the Federal Communications Commission to become a common carrier, offering its voice services to the business community.

Under the tariff filing, users can get an equivalent of AT&T's Software Defined Network, which offers low rates on so-called on-network connections between two user sites with dedicated access (see graphic).

Inacom also introduced a flat-rate service called InaCall, offering users with dedicated access a national per-minute rate of 10.5 cents on outbound calls and 11.9 cents on 800 calls. Switched access rates are higher, and the 300 offering involves additional charges for delivery of the automatic number identification typically used to trigger com-



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*— a hearty bunch to be sure — have dedicated themselves to building robust network and remote access solutions...and to support the people who use them with intelligence and, most of all, warmth.*

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# Local Networks

Covering: Operating systems • LAN management  
Hubs • Switches • Adapters and other equipment

## Briefs

■ **Fast Ethernet provider Asante Technologies, Inc.**, based in San Jose, Calif., enhanced its **fast Ethernet** product line last week with the rollout of a 10M/100M bit/sec bridge as well as a new fast Ethernet hub.

The two-port bridge is designed to sit between a fast Ethernet hub and a 10M Ethernet bit/sec LAN, segmenting the network in order to reduce network congestion.

The new unmanaged hub is available in either six- or 12-port versions and can be used in workgroups with high-bandwidth requirements.

Pricing for the 10M/100M bit/sec bridge is \$1,395, and the fast Ethernet hub pricing starts at \$1,095. Both products are available now.

Asante: (408) 435-8388.

■ **Wireless LAN vendor Laser Communications, Inc. (LCI)** recently rolled out its S Class of **wireless Ethernet and token-ring** bridges for short-range links.

The tetherless device provides line-of-sight laser transmissions for distances up to 700 feet, avoiding the cost of leased telephone lines and private cables.

The S Class laser link costs \$7,495 and is available now. LCI: (800) 527-3740.

■ **San Jose, Calif.-based Accton Technology Corp.** last week rolled out a suite of **fast Ethernet workgroup devices** to help net managers relieve congested networks.

New products include an eight-port fast Ethernet hub, a two-port 10M/100M bit/sec Ethernet switch and fast Ethernet adapter cards. Also, the company rolled out an eight-port fast Ethernet switch with five 10Base-T ports, two 100Base-T ports and one combination port that can support either technology.

The hub is priced at \$1,595, the two-port switch is priced at \$1,495, the eight-port switch sells for \$3,395, and the adapter card sells for \$199. All products are available now.

Accton: (408) 926-9288.

## Fore adapts to users' changing ATM needs

By Michael Csenger  
Warrendale, Pa.

In the chicken-and-egg debate over ATM to the desktop vs. ATM in the backbone, Fore Systems, Inc. already has learned how the market cast its vote.

Since last spring, when the company started shipping its ASX-200BX and ASX-1000 dedicated Asynchronous Transfer Mode LAN backbone switches, revenue from smaller workgroup switches has tumbled from 100% to just 14% of Fore's overall switch sales.

Backbone switching, despite its greater cost per port, is what users want from ATM.

"You have to recall that Fore was obsessed with taking ATM to the desktop," said Paul Johnson,

an analyst with Robertson, Stephens & Co., a financial research firm in San Francisco. "The whole focus of where they're taking the technology has changed, and their business model is changing as a result."

Fore would be "just another ATM hardware vendor" if it had not evolved, he said.

"Fore's backbone strategy is going to be successful because it lets them leverage their software content," Johnson said. "In the backbone market, features and functionality are software-based, and that's a much more profitable, value-added business to be in. Just look at Cisco."

Fore first entered the ATM market in 1993 with its ASX-100 LAN switch, which evolved into

the ASX-200. With 12 to 24 155M bit/sec ports, the switches were designed for linking workstations into an ATM workgroup but often wound up being used as a LAN backbone switch because Fore offered no other.

But for heavy-duty backbone applications in a campus or large building, the ASX-200 lacked the capacity and fault-tolerant features users required. So last spring, Fore introduced a pair of next-generation switches, the ASX-200BX and 1000, for backbone use.

Scalable up to 10G bit/sec and with redundant power supplies and other features for mission-critical applications, the 1000's starting price is over \$2,000 per port. The ASX-200 workgroup switch can be configured for under \$1,500 per port, including the workstation adapter cards.

Some observers see strong signs of ATM becoming a mainstream technology, and they say Fore's product evolution has the company well positioned.

"I'm starting to hear more large users say they need ATM in the backbone — after they've been delaying that move as long as possible," said Tam Dell'Oro, president of the Dell'Oro Group consultancy in Menlo Park, Calif. "They've been waiting for standards to come out because they don't want to be stuck with interoperability problems."

Despite customers' patience, bandwidth constraints are forcing them to move to ATM in the backbone, Dell'Oro said.

"Fore is selling a lot of backbone switches because that's where ATM most helps to relieve a congested network," she said. "ATM may be breaking loose of the test bed stage."

By the second half of next year, Dell'Oro expects many customers will be using ATM backbones to tie together switched Ethernet LANs.

How well Fore continues to manage its growth in a market that is only going to get bigger

should be interesting to watch. The company is expected to vault past the \$100 million mark this year, jumping from \$75 million in fiscal 1995 — which closed in March — to an estimated \$166 million in 1996, according to Johnson.

"They face the challenges of any young, fast-growing company," he said. "But they've already handled themselves well through some interesting transitions and have overcome more demanding challenges than most people suspect," he said, referring to the fact that Fore has managed to satisfy Wall Street despite some difficult quarters.

Fore President and Chief Executive Officer Eric Cooper pointed out that Fore did not stumble upon backbone

switching by accident.

"All along we've been broadening our product line, from adapter cards to high-capacity switches, on a core architecture that shares the same chips, the same software," Cooper said.

"So trying to pin down a favored market sector is like asking which of our children we love best," Cooper said. "Backbone switching has picked up now, but you'll see that it's a onetime changeover. In a few years, once customers have put ATM into the core of their networks, backbone sales will settle down and we'll then see the desktop market start to expand."

At that point, Cooper said, the software expertise being gained now in Fore's high-end switches will pay dividends in low-end workgroup sales. He said he does not expect the day to come when ATM switches become commodity items.

"With virtual LANs and all the plug-and-play requirements that come to bear, there'll be no end of ways to add value," Cooper said.

Csenger is a contributing writer to Network World.

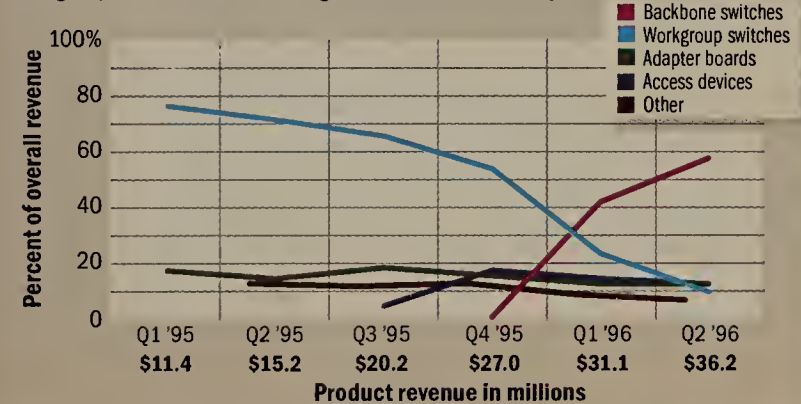


"We're using the same architecture throughout our product lines. It's all a variation of a theme."

Fore's Eric Cooper

### FORE GETS ITS BACKBONE UP

Backbone switches have quickly become a bigger revenue generator for Fore than workgroup switches since making their debut earlier this year.



GRAPHIC BY D. BARKER

SOURCE: ROBERTSON, STEPHENS & CO., SAN FRANCISCO

## Newbridge demos VLAN wares

By Jodi Cohen  
San Jose, Calif.

Newbridge Networks Corp. became the first vendor to demonstrate routed LAN emulation using the ATM Forum's Multi-protocol Over ATM (MPOA) specification here at the recent VLANs: Virtual LANs and Switching conference.

Newbridge's Release 2 of the VIVID ATM LAN product family will incorporate TCP/IP routing services based on MPOA. Unlike LAN emulation, which only supports bridging, MPOA allows for routing between subnets. Newbridge will migrate users to MPOA-routed LAN emulation via software upgrades to the router server, Yellow Ridge

Ethernet-to-ATM switch and network interface cards.

Rick Tinsley, vice president of Newbridge's VIVID group, said adding routing services will not only allow ATM- and Ethernet-attached users to communicate in the same IP subnet, but also to communicate across different subnets without experiencing the performance bottleneck of traditional routers.

"Our approach allows you to build a virtual router, which will boost performance and reduce management complexity," he said.

Release 2 of the VIVID software will begin beta testing next month. Pricing has not been set. ©Newbridge: (703) 834-3600.



FIRE D WINDOWS

Dave Kearns



## Pros and cons of Microsoft's NetWare connectivity tools

**L**ast week, I listed the five possible solutions for connecting your Windows 95 client to your NetWare network—three Novell, Inc. offerings, as well as Microsoft Corp.'s Client for NetWare networks and Client for NetWare Directory Services (NDS). This week, we'll take a closer look at Microsoft's offerings.

Continuing the practice started with Windows 3.1, Microsoft included the software necessary to connect to NetWare with Windows 95. Unlike the software with 3.1, however, Novell played no part in the writing, testing or release of the Windows 95 Microsoft Client for NetWare nets.

In fact, Microsoft built its Client for

NetWare by reverse engineering Novell's Client software developers' kit (SDK) for Windows. On the whole, Microsoft did a good job. Most people can install Windows 95 (while connected to the network), reboot and be reconnected to the net with little fuss. The Microsoft clients also will use Novell's real mode ODI drivers as well as either real mode or protected mode Network Driver Interface Specification drivers.

The one major flaw with this client was that it did not support NDS, which meant NetWare 4.X servers were only accessible under bindery emulation.

Two months after releasing Windows 95, though, Microsoft released the Client for NDS, which can be obtained from Microsoft's download service, File Transfer Protocol server, World-Wide Web server or the WINCON forum on CompuServe. In addition to the client, NetWare 4.X users should download the updated SHELL32.DLL (from the same four places), needed for the Add Printer Wizard of Windows 95.

Among the pluses of the Microsoft clients are their speed and efficiency—they are at least as fast as Novell's own NETX and use a remarkably small memory footprint, all of it above the 640K-byte boundary. You also can configure your Windows 95 machine to support file and printer access from other PCs on the network.

So for a plain, almost default installation of NetWare, the Microsoft clients should handle almost all of your needs. But (you knew there would be a "but") there are a number of drawbacks. While Microsoft has incorporated hooks to most of the calls from Novell's Client SDK, it didn't include all of them. Some NetWare-specific software will not run properly on Microsoft's NetWare clients.

### Tip of the week

*If you're having problems with programs that want to read environment variables, be sure to check out WINSET.EXE on the Win95 CD-ROM in \Admin\AppTools\EnvVars\*

The Microsoft clients also emulate LOGIN.EXE to a certain extent, at least as far as allowing drive mappings, server attachments and other standard logon commands. But search drives appear to always map to the root directory of the volume you name. So you'll need to use the command "MAP ROOT" to ensure that files can be found by applications.

The NDS client will not search beyond the ROOT context of the directory—again, fine for a default installation, but not for a big network. The Microsoft clients include an autoreconnect feature.

Next week, we'll look at Novell's client offerings for Windows 95.

*Kearns is a former network administrator and now is a freelance writer and consultant in Austin, Texas. He can be reached at kearns@msn.com.*

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Key #85107





# When it comes to ATM networks, think about restraint

RESULTS

By MacAskill and Melinda Le Baron



**O**K, it's time to drag out an old cliché: Look before you leap.

Over the course of the last few weeks, there has been a rash of announcements regarding Asynchronous Transfer Mode, our latest panacea technology. New offerings include Cisco Systems, Inc.'s latest switch, 25M bit/sec

ATM equipment from Madge Networks, Inc. and numerous releases extolling support for Version 1.0 of the LAN-emulation standard.

Thanks in large part to this recent activity, our phones have been ringing off their hooks as salivating users reach out for help in designing and implementing

their ATM-based nets.

Our advice has been singular in nature: Even though we're only an exit or two away from our ATMland destination, it's time to pull off the high-speed super-highway, refuel, check the tires and see if we need any oil.

In other words, ATM is still mostly a proprietary game, and aggressive adoption of this technology now is still fraught with some significant peril.

The good news is we're getting closer to practical implementation. If we can agree that ATM needs to emerge in three distinct areas of the network — desktop, backbone and wide area — then the upside is that we're only about six months away from meaningful installations in one of those areas: the backbone.

For many users, ATM first will emerge on the backbone, and we expect ATM will begin to have a measurable impact in this portion of the network during the second half of next year. ATM then will begin to erode FDDI's stranglehold on the backbone market sometime late in 1997.

Bet that sounds a lot different from the visions the vendors have been painting for you.

Can you build an ATM backbone right now? Of course you can. But if you want anything close to a functional net, you'll be locked into one vendor. And you have no assurance that this new backbone will be able to seamlessly integrate with your existing environment or that you'll be able to port existing LAN-based applications over it.

Support for the first version of LAN emulation — despite vendor claims — does not automatically mean interoperability either. As a matter of fact, several clients have run interoperability tests on their own with various vendors' gear, and the results have been less than encouraging. Interoperability and compatibility may be the biggest stumbling blocks to implementing campuswide ATM.

Oh, and one other thing: Don't expect to get the most comprehensive net management schemes to control your new net from the get-go. Much work still has to be done in this area, especially with virtual LAN technology, which is one of the biggest reasons why ATM is so attractive.

We are not anti-ATM. It is easy to see the value in this technology and the benefits it will bring to the table when standards have stabilized, prices have dropped further, and interoperability is proven beyond a reasonable doubt.

But before pulling off at the ATM exit, make sure you have clear and crisp answers to what problem you're really trying to solve. The lure of end-to-end enterprise ATM will not be a cost-effective one over the next three to five years, except in the minds of the luxurious few.

*Le Baron is a research director and MacAskill a senior research analyst in Gartner Group, Inc.'s Network Computing Infrastructure group. They can be reached by E-mail at inquiry@gartner.com or by phone at (203) 316-1111.*

Stratus	Ultrix	HP/UX	Solaris	Auspex	SunOS	NetBSD	Linux
Pyramid	IBM AIX	NeXT	Distinct	IRIX	Unisys	SCO UNIX	Tandem
NetBSD	Linux	Univel	Process	Cray	Stratus	Wollongong	HP/UX
Unisys	NetManage	HP	HP/UX	TGV	Pyramid	FTP	Solaris
Distinct	Tandem	Auspex	SunOS	IBM AIX	SGI	Digital UNIX	Univel
IP/UX							Unisys
NeXT							Cray
unOS							IRIX
Linux							Process
Pyramid							Distinct
TGV	Linux	Ultrix	Stratus	NetManage	HP/UX	Pyramid	IBM AIX

## SO MANY SERVERS

NFS/Share™ allows Macintosh users to take advantage of distributed file sharing in a multivendor environment. Based on Sun Microsystems' Open Network Computing/Network File System (ONC/NFS), NFS/Share provides seamless access to NFS-supported services such as UNIX files, IBM mainframe systems, VMS hosts, and PC servers.

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NFS/Share is the fastest NFS client on the market for the Macintosh, approaching file access rates of one megabyte per second—the equivalent of 250 pages of text per second! NFS/Share is an essential tool for any company that requires large file sharing across a network. With its seamless connectivity and ease of use, NFS/Share minimizes info-sharing hassles and maximizes profits.



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# Server vendors put their focus on management

By Ben Heskett

With network servers looking more and more alike, hardware vendors are increasingly pushing their management tools as differentiators.

The move makes sense given that servers are constantly being used to replace mainframes and minicomputers as platforms for running mission-critical applications. Vendors are trying to give customers server management tools that will let them approximate the control they had over their outgoing host systems.

The leading PC-based server vendors — Compaq Computer Corp., Digital Equipment Corp., IBM and Hewlett-Packard Co. — all now bundle management tools with their servers.

The tools are designed to predict server failures, monitor power supplies, track software assets and make sure that server-attached storage devices are working, among other things.

Since most of the tools support industry standards, such as

the Simple Network Management Protocol or the Desktop Management Task Force's Desktop Management Interface (DMI), vendors are pushing hard to distinguish their server management tools from one another.

They are touting such features as more proactive monitoring, clustered server management and support for heterogeneous platforms.

Users said such tools are invaluable.

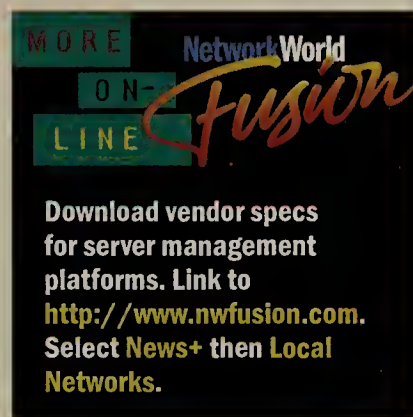
"Before these tools came around, it was very hard to know how many users were on the system, how many hits the network was taking, how much memory was being used. Now I get warnings before any of that happens," said Lloyd Blauen, a LAN administrator in the USAir, Inc. operations research department in Arlington, Va.

## Digital debut

Opinions are mixed as to which vendor has the best set of

tools, though Digital impressed many observers with its ServerWorks Manager and ServerWorks Quick Launch set of server management and start-up software introduction at Comdex/Fall '95 in Las Vegas last month.

Like Compaq's QuickStart, ServerWorks Quick Launch is a CD-ROM based tool that easily gets a server running. Such an offering can be especially useful for branch offices that have capable, but not always top-of-the-line, technical experts on-site.



ServerWorks Manager is an SNMP-based tool for managing Digital's Prioris PC servers, which it comes packaged with, and other SNMP-based devices, such as hubs and routers. Digital's Alpha server series may be compatible with ServerWorks Manager soon.

The Windows-based tool automatically discovers SNMP-compliant network devices and builds a network topology map from that information. It can be employed to remotely manage servers running NetWare, Digital's Pathworks and other server software.

According to Sylvia Clark, an analyst at the Aberdeen Group, Inc. consultancy in Boston, Digital's server management software is attractive because it gives administrators control over servers and other net devices.

The software works in conjunction with enterprise managers, such as Digital's Polycenter Manager on NetView, and third-party tools, such as those for software distribution. In the works are backup and restore capabilities for servers running Cheyenne Software, Inc.'s backup software, according to John Hargreaves, Digital's product marketing manager for ServerWorks product.

## From here to NetFinity

Analysts said Digital's server management tools are some-

what similar to IBM's NetFinity offerings, which support both SNMP and DMI.

NetFinity, currently at Version 3.05, comes bundled with most IBM PC servers and desktop systems. It can be employed to manage systems running OS/2, NetWare, Windows, Windows 95 and, in early 1996, Windows NT.

NetFinity includes asset management capabilities, fault monitoring and limited help desk functions.

According to Lynda Fitzpatrick, an analyst at International Data Corp. in Framingham, Mass., NetFinity is the best of the server management bunch "because you can drill down so far into the machine."

Future areas of focus include World-Wide Web server management, guaranteeing high server availability, remote management and clustering management tools, according to Mitch Medford, IBM's server software marketing manager.

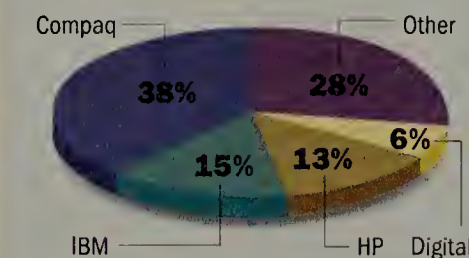
## Compaq falls short

Analysts agreed that the dominant server hardware provider, Compaq, does not match IBM or Digital when it comes to the quality of its server management software.

Even Compaq officials acknowledge that the company's customers would like to see Compaq's Insight Manager server and desktop management offering evolve into a manager of not just hardware, but also applications running on server and desktop computers.

## THE SERVER LEADERS

Worldwide PC and superserver market shares for the first half of 1995:



Based on 342,390 units shipped.

GRAPHIC BY TERRI MITCHELL

SOURCE: IDC, FRAMINGHAM, MASS.

Insight Manager, currently at Version 2.6, is an SNMP-based offering for managing servers and desktops from a central site. The software, which comes bundled with Compaq's ProSignia and ProLiant PC-based servers,

can be used to manage systems running NetWare, Windows NT, SCO Unix and OS/2, among others.

Insight Manager predicts faults and tracks storage, memory and power levels. But the company is looking for the software to do much more.

Jeff Erramouspe, Compaq's director of software marketing in its systems division, said the company in 1996 will look to "provide the glue" that ties the hardware, applications and event management into one complete administrative answer. Among other things, Compaq will try to extend the software to let customers manage internet-working products, such as the ones that the company recently obtained via its NetWorth, Inc. and Thomas-Conrad Corp. acquisitions.

In the meantime, Erramouspe said Insight Manager works with more enterprisewide management systems, such as Novell, Inc.'s Managewise, HP's OpenView and IBM's NetView.

Aberdeen's Clark said Compaq will need the support of strong third-party partners to compete with the likes of IBM and Digital on the server management front.

## Management guru

One server vendor not to be taken lightly in the management arena is HP, a powerhouse in the enterprise management market with its HP OpenView offering.

HP's server management offering, NetServer Navigator, includes tools for configuring servers, diagnosing problems, collecting performance statistics on PC LAN adapters and generating predictive warnings. It also contains NetServer Assistant, which includes OpenView for Windows, HP's workgroup net management system. In addition, it can be used in tandem with HP's Unix-based OpenView product for enterprise management.

Customers "are going crazy because they feel like everybody is trying to manage little boxes" instead of the entire network of PCs, printers, and a variety of file and print and application servers, said Maureen Mellon, HP's product marketing manager for the network server division. ■

## DMTF server standards due this month

The Desktop Management Task Force (DMTF) is expected to release a specification later this month designed to help companies better manage servers.

The specification, which is under review by the DMTF's technical committee, should let companies keep a closer eye on server components, such as CPUs, cooling fans and power supplies.

Compaq Computer Corp., Dell Computer Corp., Digital Equipment Corp. and IBM are among the vendors that have taken part in crafting the server management information format (MIF) and are expected to start shipping products with support for the spec in early 1996.

While complying with the serverspec may make it a little

harder for vendors to differentiate their server management tools, they still will be able to provide functionality on top of what the MIF provides, said DMTF Chairman Edward Arrington. And users will benefit greatly by being able to

monitor multiple vendors' servers via the same DMI-compliant management tools, he said.

Vittal Kini, the server working committee chairman, said concern about renegade companies ignoring the standard is minimal. The DMTF "uses market

pressure as the enforcement mechanism for people to follow the standard," he said.

The DMTF also has been or is working on MIFs for managing desktop computers, printers and software, among other things.

By Ben Heskett



DMTF Chairman  
Edward Arrington





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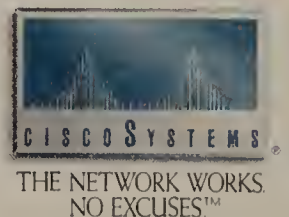
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# Client/Server Applications

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## Briefs

■ **Powersoft Corp.**, a subsidiary of Sybase, Inc., last week began beta-testing Version 5.0 of its **PowerBuilder** client/server development tool.

The new version, which will let developers distribute PowerBuilder applications among clients and servers, is scheduled to ship in the first half of 1996.

Version 5.0 also includes a compiler, which results in faster applications. Pricing was not available.

Powersoft: (508) 287-1500.

■ **TeamWARE**, a division of ICL, Inc. in Santa Clara, Calif., is shipping **TeamWARE Office 3.5**, a new version of its **groupware** that includes electronic mail routing capabilities and tighter integration with the company's **Messaging Server**.

The new version also lets users route a document directly from the application in which it was created.

TeamWARE Office modules run on Windows, OS/2, NetWare and several flavors of Unix. The modules cost between \$60 and \$450 per user.

TeamWARE: (800) 240-8326.

■ **Cognos, Inc.** of Burlington, Mass., last week announced plans to include **business forecasting technology** in its **PowerPlay** and **Impromptu** decision-support tools by mid-1996.

The company will license artificial intelligence technology from U.K.-based **Right Information Systems** that lets users extrapolate future business performance and trends from existing data.

The company also announced **Axiant 1.2**, a new version of its Windows-based client/server development tool that now supports **Digital Equipment Corp.**'s **OpenVMS** operating system, a new client debugger and an improved user interface. Axiant 1.2, scheduled to ship in February, costs \$2,995.

Cognos: (617) 229-6600.

## Oracle, Microsoft shake up their database menus

*InterOffice aimed at companies that need to manage branch office databases.*

By Barb Cole

Redwood Shores, Calif.

Oracle Corp. this week will announce a suite of client/server software designed to help large companies centrally manage databases and client/server applications running at branch offices.

The software, dubbed Oracle **InterOffice**, is an integrated suite that includes a modified version of the company's flagship **Oracle7** database, electronic messaging capabilities

and World-Wide Web software. It also includes facilities for remotely installing and maintaining applications and data.

With a single logon, users can gain access to messaging, printing, file sharing, Web services and databases, said Paula Cappello, a senior director at Oracle.

At the core of the suite is Oracle **InterOffice Manager**, a Windows-based tool for monitoring applications, nets, databases and operating systems. The offering lets administrators distribute,

install and maintain software, as well as diagnose and solve remote system and database problems from a central point, Cappello said.

Oracle **InterOffice** will be offered in two versions. An **Enterprise Edition** will include a parallel server option, sophisticated replication capabilities and gateways to legacy data sources. The **Workgroup Edition**, positioned against Microsoft Corp.'s **BackOffice**, will offer simple, read-only replication, Cappello said.

The new package is aimed at large companies that wish to deploy sophisticated applications on Intel Corp. hardware at thousands of branch offices where there may not be any technical personnel on-site, she said.

"In that setting, there's a requirement for a preconfigured platform," Cappello said.

Analysts said a suite like Oracle **InterOffice** could help companies reduce the number of personnel needed to manage distributed databases and applications.

"If they can come up with something that is integrated, easy to install and easy to program, it may be a very viable approach," said Dan Kusnetzky, an analyst at International Data Corp. in Framingham, Mass.

See **InterOffice**, page 36

*SQL Server 6.5 to support more complex applications.*

By John Cox

Redmond, Wash.

Microsoft Corp. last week revealed details about the next release of its **SQL Server** database, which will feature several key changes intended to make it more suitable for large decision-support and data warehouse applications.

Version 6.5, which enters beta testing during the first quarter, will run on bigger multiprocessor systems and let users copy data from **SQL Server** to non-Microsoft databases. In addition, it will have several new **SQL** extensions to let applications run complex queries to summarize data and to let end users look at that data from different angles.

Such changes are needed to reassure corporate MIS groups that Microsoft is delivering the kind of high-performance, reliable database platform they need for distributed applications, said

See **SQL Server**, page 36

### ORACLE'S INTEROFFICE SUITE

#### Branch office

- ▶ Oracle7 database
- ▶ Messaging
- ▶ Web browser
- ▶ SQLNet networking software
- ▶ Mobile computing software
- ▶ Oracle Objects for OLE

#### Headquarters

- ▶ Centralized help desk
- ▶ Database administration
- ▶ User management tools

#### Internet

InterOffice provides branch offices with a scaled-down version of Oracle7 and other applications, plus links to a centralized server from which an administrator can set up and configure remote database sites.

## Application development

## Tool vendors answer the call for database-to-Web connections

By John Cox

Palo Alto, Calif.

A pair of new products released last week will make it easier for corporate developers to build World-Wide Web server-based forms that are linked with networked databases.

Spider Technologies, Inc. has released Version 1.5 of its **Spider** development tool set, which includes a new Web-to-database interface that bypasses the performance limitations of the standard **Common Gateway Interface (CGI)**.

CGI scripts let programmers build applications that relay information and actions between Web forms and back-end corporate databases. But CGI was not designed to support large numbers of users, nor was it built for speed and reliability,

according to Zach Rinat, president of Spider, based here.

Spider 1.1 offered a set of visual tools for linking Web forms to a database, via **CGI**. Version 1.5 offers an optional, high-performance interface that resides on the Web server and can be called through the **Netscape Server API**, from **Netscape Communications Corp.**

Alternatively, the Web server still can call **CGI**, which then invokes the new **Spider** interface. By doing so, **CGI** off-loads a lot of work to Spider, improving overall performance, Rinat said.

The Spider 1.5 interface also includes a queuing feature,

which stores incoming user requests instead of simply blocking them.

The product will be available this month. A single-user license costs \$1,495; a workgroup license for five developers, 10 concurrent users and a native link to one database server is priced at \$4,595. The Enterprise version supports native links to multiple databases and costs \$7,995.

### Moai offering

Separately, start-up **Moai Technologies, Inc.** of San Francisco is introducing a similar product called the **Business Object Architecture (BOA)**. It is

a visual development environment for creating Web forms, linking these with a set of objects that represents data elements in the database manager, and then deploying the finished application on a Web server. **BOA**, like **Spider**, generates **HTML** and **CGI** scripts, as well as **SQL** commands.

Release 1.0 runs on 16- or 32-bit Windows clients and Windows NT servers. Other platforms will be added by June in Release 2.0, which will run faster and support additional client-based functions through an optional plug-in interface to **Netscape Navigator**.

Pricing and ship dates were not available.

Spider: (415) 969-6665; Moai: (415) 928-6481.



Rinat says CGI hands off much of its work to Spider, improving performance.

MORE ON THE LINE

See what features Microsoft rivals like Sybase and IBM are adding to their databases. Link to <http://www.nwfusion.com>. Select News+ then Client/Server Applications.



## BMC forges mgmt. links with Cabletron, HP, Tivoli

By Barb Cole  
Boston

BMC Software, Inc. last week announced plans to integrate its Patrol tool for database and application management with management platforms from Cabletron Systems, Inc. and Tivoli Systems, Inc.

PatrolView, an add-on to Patrol, will let users view their computing infrastructures via Patrol's management console or from Cabletron's Spectrum or Tivoli's Tivoli Management Environment (TME).

PatrolView forwards information about Patrol-managed databases and applications to the third-party platforms via a combination of the Simple Network Management Protocol and Patrol's own Management Information Base.

Also, BMC announced what it calls agent-to-agent integration between Patrol and Hewlett-Packard Co. OpenView OperationsCenter. This enables Patrol-detected events to be translated and passed directly to

the event manager agent in OperationsCenter. With agent-to-agent integration, Patrol corrects events within its span of control and passes other events to OperationsCenter.

Wayne Morris, product marketing manager for open systems at BMC, said the move is part of the company's plan to help firms add much-needed database and application management without replacing their management platforms.

PatrolView already works with

Computer Associates International, Inc.'s Unicenter, HP's OpenView, IBM's NetView for AIX, Sunsoft, Inc.'s SunNet Manager and Digital Equipment Corp.'s Polycenter Manager.

Analysts said such integration is key in light of the absence of interoperability standards. "The only way to solve the [interoperability] problem now is through cooperation among vendors," said Ray Paquet, an analyst at Gartner Group, Inc. in Burlington, Mass.

PatrolView for Tivoli TME is available now; the Cabletron version is expected in the second quarter. PatrolView costs \$2,500 per management console.

©BMC: (713) 918-8800.

## InterOffice

Continued from page 35

Many companies are "screaming that distributed computing looked good, but resulted in higher cost systems," he said.

Some Oracle users were intrigued by the remote management capabilities but were not sure how useful InterOffice would be in heterogeneous environments. "We always want to administer servers remotely, but

we have lots of different databases and several platforms," said Chuck Sauer, manager of network support and development at Motorola, Inc. in Tempe, Ariz.

Oracle InterOffice will ship in May for SunSoft, Inc.'s Solaris and Windows NT. The company plans to support additional operating systems in the future. Pricing information was not available.

©Oracle: (415) 506-7000.

## SQL Server

Continued from page 35

Gary Voth, group product manager for SQL Server.

The new SQL extensions will support what is known as on-line analytical processing (OLAP), in which users typically run ad hoc queries against large databases, searching for patterns and trends. OLAP capabilities are being delivered today in PC-based data analysis tools and by specialized OLAP databases.

To handle OLAP today with SQL Server, customers have to write a lot of procedural language and SQL code, acknowledged Dan Basica, a product manager with Microsoft's SQL Server group. "These extensions will really simplify the work of consolidating data, and pulling it into one view in a data warehouse," he said.

Version 6.5 also will let users process a query using a particular stored procedure on one

server, save the results to a table and then send that table to any number of other SQL Server databases for access by local clients. Currently, the results of such a stored procedure action can only be returned to the requesting client.

The change will let multiple users access, for instance, the results of a report without having to run the report themselves.

Currently, SQL Server databases can only copy or replicate data to other SQL Servers. But Version 6.5 will let them copy also to DB2 on all IBM platforms as well as to databases from Oracle Corp. and Sybase, Inc., according to Voth. The databases will be

able to copy to Microsoft Access, the company's PC database.

"It's going to save my butt right now because we're working on a project that replicates data to an AS/400 running DB2/400," said Ken Moss, president of Moss Micro, Inc., a San Juan Capistrano, Calif., client/server developer. "Right now, we're writing our own synchronization code between SQL Server 6.0 and the AS/400. With 6.5, we'll just hit a button and Microsoft will take care of it."

©Microsoft: (800) 426-9400.



"SQL Server 6.0 is very scalable today for up to six processors and still delivers very good scaling up to eight processors. Version 6.5 will be even better."

Microsoft's Gary Voth

## SHARED LOGIC

# Exchange your expectations concerning messaging

Many of you probably think I have something against Microsoft Corp. since I'm always disparaging the company in my writings and presentations. And the fact is, I do. Yet being honest with myself, I realize that it stems mostly from jealousy.

I'm jealous of the way Microsoft can come into a market with much fanfare and little product, eventually get it right, smoke the competition and laugh all the way to the bank.

Will the Internet be any different, as Microsoft finally pokes its head out of the sand? Yes, the company is drastically behind Netscape Communications Corp. in mind-share, installed base, market multiple and Internet-oriented relationships. But this game is far from over.

That brings me to the much delayed, poorly positioned, tremendously disappointing — thus far — messaging/groupware offering from Microsoft called Exchange. Those with elephantine memories will recall that Microsoft first unveiled what is now known as Exchange about three years ago. The firm has been in damage control ever since.

Once upon a time, Exchange was trumpeted to be the Lotus Notes killer. But Micro-

soft's tune has justifiably changed. Exchange will be a very good electronic mail system, but that's about as far as it goes.

Without a doubt, Exchange will scale upward of 1,000 users per server, offer Simple Mail Transfer Protocol and X.400 transport, include integrated calendaring and be tightly integrated with Windows NT management. In addition, last week's announcement of local replication will be a boon to mobile users that can selectively download bulletin boards and groupware-like application folders while on the road.

But I'm not ready to crown it champion quite yet.

First, Microsoft must ship the product. I've seen increasingly stable beta versions pretty regularly over the last year. Now, with the "release candidate" (that means "pretty damn close" in Microsoft lingo) expected this month, we actually may see a generally available version of Exchange in the February or March time frame.

Next, the company needs an installed base, but that's the least of its problems. I've had clients foaming at the mouth for two years to get their hands on a stable version. Even the NT dependency doesn't scare off

most of them.

The last key piece is the cottage industry to develop around Exchange. Notes business partners number over 10,000, while I can probably count on my hands the number of complementary products that will ship in coincidence with Exchange's release.

Now if there is one thing I've learned to count on in this crazy world of technology, it's that Microsoft eventually will get it right, and I'd bet Exchange Server will be no different. Expect a very good mail system initially, but don't expect a competitor to Notes for at least 18 months.

After all, it will take some time to duplicate the channel, tools and installed base, even for Microsoft. And don't expect Lotus to stand still.

So if you are in need of a more scalable, manageable and functional mail system, and you aren't scared off by having NT in every nook and cranny of your infrastructure, Exchange is for you.

But if you really need integrated messaging and groupware in the short term, you'd better exchange the gift Bill is leaving under your Christmas tree for something a bit more realistic.

Rothman is a vice president in META Group, Inc.'s Global Networking Strategies service in Reston, Va. Feedback is welcome either by E-mail at MikeR@metagroup.com or by phone at (703) 860-6600.



Mike Rothman

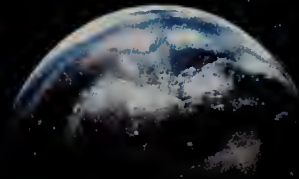
## BusinessBriefs

Menlo Park, Calif.-based **Gupta Corp.** last week announced plans to codevelop and jointly market products with middleware maker **Open Environment Corp.** in Boston. The first offering is QuickRPC, software for building three-tiered applications with Gupta's SQLWindows client/server development tool. Such applications are distributed on clients, application servers and database servers. QuickRPC works with Open Environment's Entera middleware. The software is available now for \$595.

Client/server development tool maker **Vision Software, Inc.** in Oakland, Calif., has received \$6.5 million worth of new venture capital funds. Vision sells software to automate the development of client/server applications. The company plans to release a new development tool early next year aimed at building industrial-strength applications.



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the earth were round?



**What if**  
man could walk on the moon?

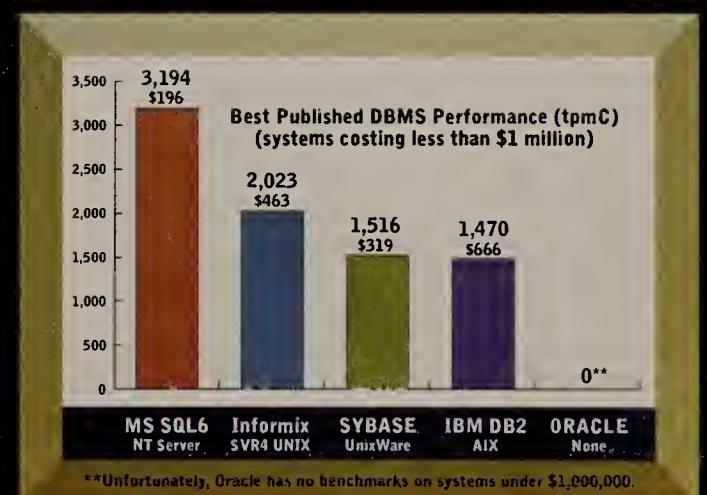
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it. Read the study and all the details yourself on-line at <http://www.microsoft.com/SQL>. Or call us at (800) 586-0391, Dept. VV5, and we'll send you a copy. Sure it's hard to believe, but so was Columbus.

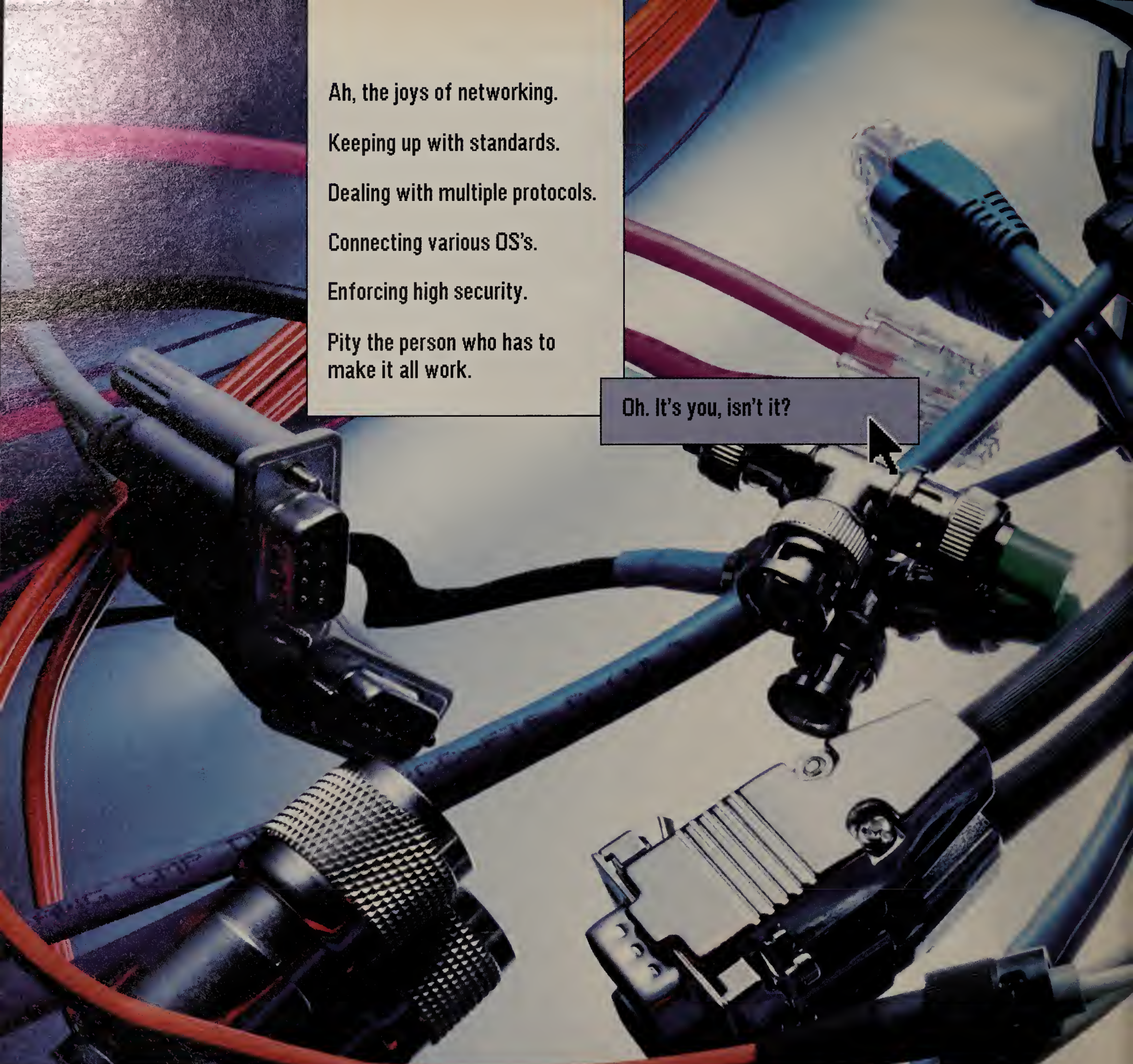


\*TPC results as of November 29, 1995. Microsoft results based on Digital AlphaServer 2100 5/300 @ 5 and Windows NT Server 3.51. Informix results based on Unisys U6000/500 Model 50 v. 4 on System SVR4 UNIX 1.4. Sybase results based on Compaq ProLiant 4500 5/100 Model 1 and UnixWare 2.0. IBM results based on RS 6000 POWERserver R24 @ 5 and AIX 3.2.5 ©1995 Microsoft Corporation. All rights reserved. Microsoft is a registered trademark and Where do you want to go today? and Windows NT are trademarks of Microsoft Corporation. Compaq is a registered trademark and ProLiant is a trademark of Compaq Computer, Inc. Digital is a trademark of Digital Equipment Corporation. AIX is a registered trademark and POWERserver is a trademark of International Business Machines Corporation. Unisys is a registered trademark of Unisys Corporation. UnixWare is a registered trademark of Novell, Inc. TPC is a registered trademark of Transaction Processing Performance Council. UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Company, Ltd. All other trademarks are the property of their respective owners.

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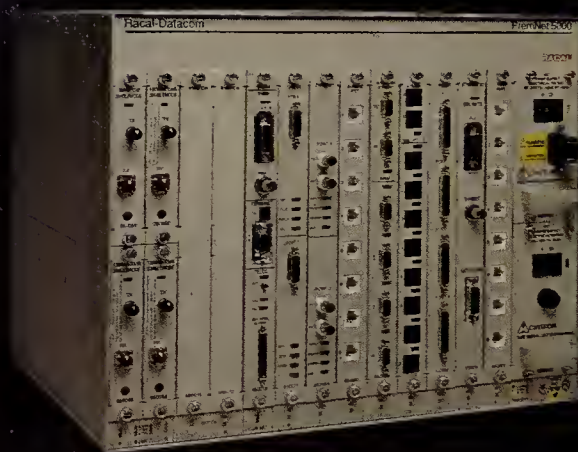


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Communicating through technology



# Electronic Commerce

**Covering:** Tools and Techniques for Interenterprise Networking  
and Doing Business On-Line

## Briefs

At the Bank Administration Institute's Retail Delivery Conference in Atlanta last week, banking on the Internet moved forward following announcements that included:

■ **By the second quarter, US Order, Inc.** expects to ship Electronic Merchant Center, a \$50,000 Unix workstation with software for World-Wide Web access that will let merchants design billing templates and give customers direct access to statement information.

The billing workstation will support **Visa Interactive, Inc.'s Epay standard**, so customers using a Web browser can choose to pay bills immediately. Merchants can also set up the workstation to send bills to customers over the Internet.

US Order: (703) 834-9480.

■ **Online Resources & Communications Corp.** will provide banks with turnkey software and services to set up **Web bank sites** that will also link to back-end mainframe processors.

Online Resources: (703) 442-4646.

■ **Financial institutions and software providers have established the Open Banking Consortium.** The group will provide a forum for discussion of contentious **Internet banking issues**, such as control of customer accounts or brokerage partners, security and digital cash. The consortium's members include Hewlett-Packard Co., Microsoft Corp., Netscape Communications Corp. and Security First Network Bank.

■ **S2 Systems, Inc.** has introduced the **Automated Teller Machine Information and Monitoring System.** The system tracks and manages problems in networks by sending alarms to ProAmerica Systems, Inc.'s Service Call Management help desk software. The software then notifies a technician via pager, fax, E-mail or voice system.

S2 Systems: (214) 458-3800.

## SBT moves bean-counting business into cyberspace

By **Peggy Watt**  
San Rafael, Calif.

Familiar functions, features and (inter)faces can help a business feel comfortable about Internet-enabling its operations.

So some early adopters of electronic commerce found it only logical to go on-line when SBT Accounting Systems, Inc. moved its familiar accounting products into cyberspace.

Some SBT Internet products are already in second-generation release. SBT this month shipped WebTrader 2.0, which provides secure sales processing, and introduced payroll tools and a new Internet-spanning data monitoring tool.

In addition, SBT in September spun off SBT Internet Systems, headed by Dave Harris, who is also vice president of marketing for the parent company.

Harris described SBT Internet Systems' growing product line as "a Lego set — you add as you need to." For example, SBT this month released WebPay, a Windows-based payroll application that lets users set up and

manage direct deposits with any bank. The module works with SBT's ProSeries Payroll application suite.

WebTrader 2.0 helps businesses build an electronic storefront to process orders and to interface with SBT's accounting programs if desired. SBT partnered with Checkfree Corp., which supports on-line credit card transactions for WebTrader.

"We're just adding an electronic commerce component to our existing programs," Harris said.

SBT took a new route with WebAlert, described as an "Internet business agent" that monitors on-line transactions and requests. It alerts users by E-mail of specified conditions or events, such as inventory depletion or shipping delays.

For example, WebAlert can flag orders that hit a certain size or send a message when customers hit their credit limits. This helps businesses respond more quickly, says William Mills, president of PSI Systems, Inc., a business automation consultant in

RTN	Account No.	Account Type	Priority	Minimum	Deposit %
111111118	7333222233333333	Checking	300	70.00	
111111118	7458347823983299	Savings	300	70.00	

SBT's ProSeries with WebPay lets users set up and manage direct deposits.

Lithia Springs, Ga.

"It gives us another tool," Mills said. "This [use] is the EDI of the future." It's easier to use and cheaper than EDI, so it's available to more businesses.

Taking orders on-line can reduce errors and save costs of mistakes, noted Harold Leggett, president of Information Services Group, Inc., a Lexington, Ky. consulting firm that focuses on accounting automation, including on-line options. "You don't have to cut out many errors to see a savings," Leggett said.

Extending existing accounting tools with functions that use

the Internet is logical, Leggett said. And although companies find the Internet a useful media for distributing sales material, the bottom line will persuade them to invest in on-line operations. "The Internet payoff for a business is not in putting up audio clips of the company president on a Web site," he said.

WebTrader 2.0 is priced at \$1,295. SBT also will host a merchant's storefront through its WebStreet software, which costs \$395. WebAlert is priced at \$1,295 and ProSeries with WebPay costs \$1,295.

©SBT: (415) 444-9900.

## BUSINESS SPACE

### A brave new whirl of business

I'm British. I am an escapee from the isle of demented monarchy and wretched weather.

I'm not sure whether it's because I'm a Brit or whether it's environmentally related, but I have a streak of the curmudgeon in my makeup.

Having fessed up, I now feel I can vent my spleen and bile with a clear conscience (consider my admission a kind of warning label). That said, you won't be surprised to discover that many things irritate me. Take Continental Airlines, for instance: a wretched operation that is to air travel what Sid Vicious was to haute couture.

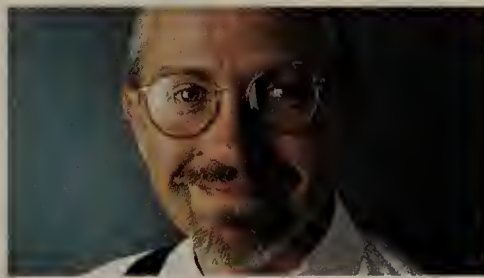
But something happened recently that, while it irritated me intensely, also made me think. My wife and I decided to take our son to see *Toy Story*. The nearest cinema is a six-

screen multiplex in Southern California, and it is not exactly an impoverished area. So wouldn't you think that they would take credit cards?

Oh, no. They would accept nothing but cash! And the nearest ATM would not read my wife's card, and I didn't have my wallet with me. Well, we finally did get cash but wound up missing that performance.

(*Toy Story* is the first completely digitally animated film, and, in my highly critical and crabby estimation, it is technically stunning. Plus, it is a clever story. I highly recommend it.)

So what does this have to do with electronic commerce? Well, it just seems incredible to me that here we are at the dawn of a new millennium and entering an era of on-line commerce, and we still have businesses that earn several million bucks per year and



Mark Gibbs

can't do something as simple as take credit cards.

Want some more examples? Well, I can't give any as I'm running out of space, but the cinema made me realize that the gap between businesses that are prepared for the brave new whirl of commerce and those — like the maddening multiplex — that seem to have only recently graduated from quill pens, is more profound than we may think. And there is a phenomenal number of the unprepared.

It is these mercantile sluggards, these business fossils, these atavistic enterprises that will impede the progress of electronic commerce. And, worse than that, they will delay the consequent benefits to all.

If you work for any business more dynamic than, say, a hot dog cart, you should be taking a hard look at how your corporation is planning for the future. If electronic commerce at the level of taking credit cards (at the very and most pathetic least) isn't in the cards, then it is time to take action. That action might involve changing companies.

Is your organization ready for the brave new whirl? Let me know at [mgibbs@gibbs.com](mailto:mgibbs@gibbs.com) or call (800) 622-1108, Ext. 504.



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## Keeping Up with Network Technologies and Standards

# Turning pagers into proactive management tools

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## EDITORIAL INSIGHTS

### Plotting your exit strategy

Every couple of years, a technology redefines how we communicate. T-I multiplexers, LANs and routers all changed our thinking about networks and what could be done with them.

That's happening today with switching. In a short time, switching has thrown into question the role of routers and fueled an M&A frenzy that has redrawn the boundaries of our industry. Switching has also created new venture opportunities for companies such as Fore and Agile, and it is erasing the artificial boundaries between LANs and WANs. And that's driving electronic commerce by making possible whole new classes of applications.

Switching brings new opportunities and headaches, and one of the biggest headaches will be interoperability among switching systems from different vendors. That issue was really driven home for me at the recent Switching and VLANs Conference.

Interoperability problems are nothing new. Most readers avoid mixing different routers in the same network, and it's still painful to get different operating systems to work together.

But the interoperability issue gets stickier when it comes to switching.

Switching is not just a new transport mechanism. Switched nets are the platform for virtual LANs—a whole new model for building networks, managing and administering them, and supporting all the applications that run across them.

Trying to balance the need for switching and the absence of VLAN standards, most customers I talked to at the conference said they are forced to buy into a single vendor's strategy. Trying to marry two technology strategies just doesn't make much sense.

That's OK for now. But you must have an exit strategy—a plan for taking advantage of standards when they are developed so you don't find yourself locked in the grip of one vendor. The cold truth is vendors view VLANs as a great way to maintain account control. Once you're in, it's hard to extricate yourself.

So before you commit to a switching/VLAN architecture, make sure your vendor commits to supporting VLAN standards down the road. Get it in writing. If the vendor hedges and tells you standards won't work, talk to someone else. Don't hand control of your network over to anyone.

John Gallant, editor in chief

jgallant@world.std.com



## DISTRIBUTED COMPUTING

### Microsoft's prospects as an enterprise supplier just got much better

IBM's MVS defines enterprise computing systems. But, in Microsoft's view of enterprise computing, MVS is an anachronism to be downsized and dispensed with as soon as possible. That Redmond attitude says it all: What does Microsoft know about enterprise computing? That's IBM's game.

Well, Microsoft has made two moves that considerably improve its potential as a supplier of information technology to large enterprises. First, the company inked a deal to license key OLE source code to Software AG of North America, Inc. Software AG will port Microsoft's software to multiple non-Windows operating systems, including MVS.

Second, on the night before Halloween, Microsoft bought Netwise, Inc., a leading vendor of remote procedure call (RPC)-based middleware, to interconnect LAN-based environments to MVS. (IBM must have found the announcement horrifying.)

This past summer, when my colleagues and I at Patricia Seybold Group, Inc. examined Microsoft as an enterprise supplier, we found the company wanting in four respects:

- Microsoft's knowledge of enterprise systems was thin.
- Its service and support for enterprise accounts was insufficient.
- It didn't have the products required to support enterprise applications.
- Its OLE technology was limited to Windows and Macintoshes.

One of our key concerns was that those of you with enterprise networks can't live using Windows alone and that Windows is Microsoft's answer to every systems problem. Our experience tells us IBM mainframes will become a vital part of new client/server applications. Integrating MVS into client/server environments involves difficult distributed computing design and integration work. Most of you prefer to have one company take responsibility for the whole solution, rather than having to organize multiple contractors.

To help you deal with the difficult systems integration problem of MVS in client/server environments, Microsoft offered SNA connectivity in BackOffice. Thanks, but SNA coding is not an answer to the MVS integration problem. Microsoft concedes that it bought Netwise in response to complaints from many of you about this situation. According to the company, you wanted a total Microsoft solution. Now you can have that solution.

The Netwise acquisition gives Microsoft much more than SNA protocols for Windows NT. Netwise's TransAccess middleware interconnects PCs, LANs and MVS resources, including CICS, IMS and DB2. The heart of TransAccess is mature RPC software. A portion of the middleware runs on the user's desktop or LAN server, and a portion runs under MVS.

In addition, a hallmark of TransAccess is its flexibility. The software can support both remote SQL access and remote function invocation on a com-



John R. Rymer

mon base. Remote function invocation is well suited to distributed access to CICS transactions and IMS databases.

In the late 1980s, Netwise built a sales force and service organization for enterprise customers. Microsoft is keeping these folks onboard. The Netwise purchase goes a long way toward eliminating the first three inadequacies listed

above. Microsoft's Software AG deal addresses the fourth issue.

It has become clear that Microsoft intends to make OLE the basis for a comprehensive enterprise environment. Microsoft will focus on creating the rich functionality required to deliver this environment. However, the company will rely on partners to make sure OLE is available on the non-Windows platforms that are important to you. Microsoft is already working with Digital Equipment Corp. and others to achieve this goal. Software AG will be the partner to port Network OLE and OLE Integration to non-Windows platforms.

Network OLE gives developers object-oriented interfaces to distributed computing services—such as Netwise TransAccess. OLE Integration allows developers to build OLE components on network servers. OLE Integration components can be shared by many desktop applications in a three-tiered architecture.

Software AG is a high-quality software engineering company with lots of experience in the enterprise market

and in distributed computing software. Microsoft was smart enough to give Software AG an exclusive license, ensuring the product consistency that is so important to you.

Microsoft won't become an enterprise expert overnight. Software AG's ports of OLE Integration and Network OLE are not expected until 1997. The other new OLE interfaces that Microsoft is building for the enterprise—OLE DB (for database access) and OLE for Transactions—are still works in progress.

Also, it remains to be seen how Microsoft will focus the new technology acquired from Netwise. If the company is true to form, it will carefully narrow the scope of its enterprise products and services. I don't expect Microsoft to begin duking it out with IBM over large, complex mainframe integration efforts right away. But expect Microsoft to grab the low-hanging fruit—the Visual Basic/SQL Server applications that need casual MVS access.

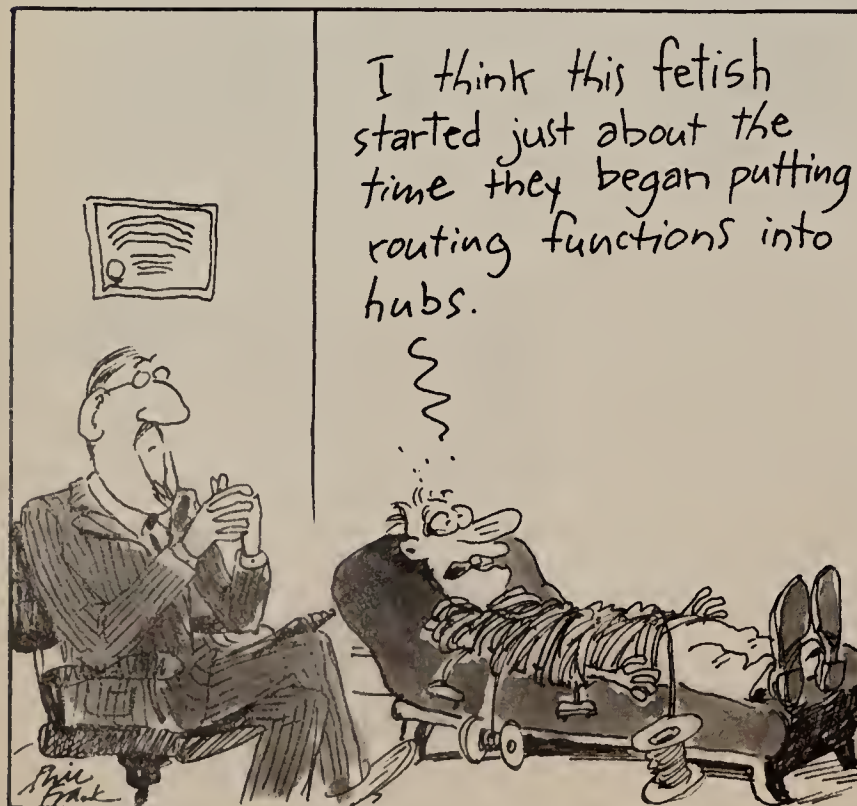
Microsoft has equipped itself to compete for some enterprise accounts right now. The company is a quick study. A lot can still go wrong for Microsoft in the enterprise. But I suspect that it won't be long before it begins to make a dent in this lucrative segment of the market. IBM's formerly exclusive game has a brash new player.

Rymer is editor-in-chief of the "Distributed Computing Monitor," a monthly report published by Patricia Seybold Group, Inc. of Boston. He can be reached at jrymer@psgroup.com.

*It has become clear that Microsoft intends to make OLE the basis for a comprehensive enterprise environment.*

## Teletoons

By Phil Frank and Joe Troise  
guru@well.com





### New law would be a setback for free speech

**A**s early as this week, a House-Senate Conference Committee is expected to report out a telecommunications bill that includes provisions which could have significant implications for users of interactive telecommunications and for the free-speech rights of Americans in general.

The telecommunications bill will be a hybrid of S.652, a Senate bill that includes the Communications Decency Act, sponsored primarily by Sens. James Exon (D-Neb.) and Dan Coats (R-Ind.), and H.R.1555, the House bill that contains a similar amendment, sponsored primarily by Rep. Henry Hyde (R-Ill.).

Both amendments attempt to control communications via computer systems, including those across the Internet.

By subjecting certain types of constitutionally protected speech on the Internet to criminal sanctions, these amendments could have a chilling effect on the free-speech rights of Americans using computer networks for communication. They could have a similar effect on the economic and technological development of this communications frontier.

This issue presents several difficult problems for lawmakers.

First, many legislators must be educated about the nature and extent of the problem, as well as the available remedies. The Communications Decency Act passed the Senate with little debate and no formal congressional hearing, so few senators were aware of what they were approving.

Second, it is difficult to explain to many people, including lawmakers, the significant difference between what is obscene and what is merely indecent, and that the law treats these differently. Trying to explain the difference, and defending free speech, opens the door to charges of coddling child pornographers. While unfair and untrue, such charges are potent political poison.

Third, there is an understandable tendency among lawmakers to act immediately when presented with a problem that involves protecting children. However, legislators must understand there is a time to act and a time to show restraint.

Consider the evidence against enacting this legislation:

■ Trafficking obscene materials or child pornography through interstate commerce or solicitation of minors is already a crime, regardless of the medium used.

■ Law enforcement officials already are pursuing child pornogra-

phers and sexual predators trolling cyberspace for victims.

■ Software already is available to filter and block reception of material parents do not want their children to see.

Some of these points are addressed by another bipartisan amendment to the House bill, sponsored by Reps. Christopher Cox (R-Calif.) and Ron Wyden (D-Ore.).

Their amendment recognizes that First Amendment protections apply to on-line communications, just as they do to media, by prohibiting regulation of content on the Internet by the Federal Communications Commission.

The Cox-Wyden amendment also recognizes the existence of technology giving parents control of children's access to unwanted material on computer networks, and even promotes the development of such technology.

It also encourages on-line service providers to be their own police to control offensive materials carried over their systems.

Having the Cox-Wyden amendment in the same bill as the Hyde amendment creates a contradiction, yet some lawmakers either

ignored the inconsistency or simply were ignorant of it.

What price do we pay for government regulation of speech on computer networks?

For one thing, communications labeled "indecent" between and among adults are protected under current law, but under the pending legislation, they would be criminal acts if conducted via an on-line system accessible by children.

We must also accept a chilling effect on the development of the technology itself. On-line providers are likely to be more cautious in promoting the free flow of information if they believe they will land in federal court.

Finally, individuals and entrepreneurs will not take the risk of going on-line with new information or products with the heavy hand of government looming.

I have urged the Conference Committee not to take this step but to instead strip the telecommunications bill of such unnecessary, unconstitutional provisions.

Given the nature of politics, I am skeptical they will have the foresight to do so.

*Feingold, a Democrat, is the junior senator from Wisconsin.*



Sen. Russell Feingold



## IN-BOX

### Many women resent rating

David Buerger's comments about the Babes-on-the-Web site (Oct. 30, page 87) indicate that he believes women whose Web pages are linked to the site are willing participants. Granted, some of them are. Many, however, are not.

If you ask nicely to be removed from the page, the owner of the Web site will remove the link. But if your message is not what he deems nice, he will continue to point to your Website.

Many women publish Web pages the same way men do, yet they are subjected to a

rating by the Babes-on-the-Web site. Then someone like Buerger accuses women of using "federally funded university networks for digital flirting." I understand that a quick glance through the Babes site can give you this impression. Imagine being one of those "tame-looking, fully clothed coeds" who simply created a home page like her male colleagues and found herself on the site.

The Internet is sometimes a hostile place for women. I fear that Buerger's comments may have added to this hostility.

*Nan Hyland  
Research programmer  
University of Illinois  
Urbana*

### Not the vendors' fault

I object to David Buerger's categorization of the inter-personal computer as a vendor Trojan horse (Nov. 20, page 73).

His comments about the results of introducing these systems into the workplace are

most likely accurate. But the results are not the fault of the vendors; they are caused by the way managers use the technology. We are still at least a generation (of people) away from managers who are knowledgeable about technology, rather than technophobic.

The vendors — even IBM — have done their best trying to educate us.

When applied to the proper problem, diskless workstations are an extremely useful solution. When applied to the wrong problem, they are everything Buerger claims — and worse.

They are a little like fertilizer. When you apply fertilizer to a garden, the result is wonderful. However, if you decide that it looks a little like carpet, and use it as a floor covering, it stinks.

The fact that it was used as a floor covering was not the fault of the person who sold the fertilizer.

*Ray Stevens  
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# Stretch your WAN limits

**Bandwidth managers**

*stand ready to help, but they come in too many shapes and sizes to make selection easy.*

By Liza Henderson and Beth Gage

**T**he pressure to utilize every last bit of WAN bandwidth is on you like never before.

Perplexed over how to assign the right amount of capacity to LAN, SNA, video and voice traffic with variable peak loads during the day, you start shopping for a bandwidth manager.

But you quickly get frustrated by the very different configuration options and wide range of prices you encounter. It seems everyone from data service unit/channel service unit vendors to router makers are nudging their way into a market that was kick-started a few years ago by inverse multiplexers and the next-generation offerings of T-1/T-3 multiplexer manufacturers.

All these bandwidth managers promise to deliver the intelligence and dynamic bandwidth allocation capabilities needed to reduce network costs and increase performance.

The products in this thriving market include everything from fixed-port WAN access devices for small remote offices to full-fledged backbone switches with prices that range from less than \$5,000 to more than \$400,000.

Part of the reason for such diversity rests with how the term "bandwidth management" has been stretched. It has been around for as long as there have been time-division multiplexers (TDM) and private lines, and it originally meant you had a way to preallocate WAN bandwidth to support various applications. However, the bandwidth you allocated remained constant whether the application needed it

or not, which resulted in underutilization.

Now bandwidth management goes beyond traditional TDM-based products to include just about anything that can dynamically allocate WAN capacity to various applications as it is needed. In fact, you can program bandwidth managers to choose the most efficient and cost-effective WAN technology available when an application requires it.

At one time, a private backbone may be the most economical, while at another, it's a switched digital service. The point is, you can establish the guidelines you want the bandwidth manager to use in making its decision—it does the rest.

Given the newer definition, today's bandwidth managers come in different shapes, sizes and configurations. Stand-alone devices with a fixed number of ports and preconfigured interfaces are typically less expensive than chassis-based units that let you add modules incrementally.

As you'd expect, the stand-alone device is less flexible and scalable than its chassis-based counterpart. Only consider a stand-alone unit if its shrink-wrapped configuration meets your present and foreseeable needs. Lean toward chassis-based products if you anticipate a number of network changes and growth—it will pay for itself in the long run.

Top-of-the-line bandwidth managers consolidate a mix of applica-

*Continued on page 50*

## Buyer's Guide



# Buyer's Guide

Continued from page 49

...such as voice, video, LAN, SNA and multimedia, on a single hardware platform. These products also can support the protocols needed to access different WAN services, such as leased lines, X.25, frame relay, Switched Multimegabit Data Service,

ISDN and Asynchronous Transfer Mode.

However, there are products that specialize in a subset of applications and services, supporting SNA and LAN data traffic over leased lines or frame relay services only, for example.

Ascom Timeplex, Inc.'s Syn-

chrony product family is among the most robust in supporting voice, data and video applications over ISDN, leased lines, frame relay, SMDS, X.25 and even satellite links.

In addition, Synchrony products route AppleTalk, DECnet, TCP/IP and IPX traffic, bridge a

mix of other LAN protocols, have interfaces for digital or analog private branch exchanges, and come with a number of other options including voice compression.

Not surprisingly, Ascom Timeplex finds itself with one of the most scalable platforms

when it comes to price, ranging from a mere \$3,200 to over \$288,000.

Even if data is the primary application on your network, you can save money by looking for a bandwidth manager capable of integrating voice traffic that is otherwise destined for

## Bandwidth managers

Company	Product	Type/ No. of ports	Bus type/ Speed (Bit/sec)	Interface card slots	Traffic type	Services						Features		Buffering type		Management platform					Price	Warranty (Months)
				Max. no. in chassis		ATM	Frame relay	ISDN	Leased line	SMDS	X.25	Bridging/routing	Oversubscription (Percent)	Per card	Per port	NetView for AIX	OpenView	Proprietary	Spectrum	SunNet Manager		
ADC Kentrox (800) 733-5511	AAC-1	Fixed/2	ATM/2M	NA	LAN, SNA, video, voice	✓				✓		200		✓	✓	✓			✓		\$5,000-\$9,000	24
	AAC-3	Chassis/28	ATM/524M	7	LAN, SNA, video, voice	✓	✓			✓		900			✓				✓		\$10,000-\$60,000	24
Ascend Communications, Inc. (800) 621-9578	Max X00 Family	Chassis/8	i960 processor (1); TDM/8	8	LAN		✓	✓	✓			✓									\$2,400+	12
	Max X000 Family	Chassis/120	i960 processor (1); TDM/8	6	LAN, SNA, video, voice		✓	✓	✓			✓	200				✓			✓	\$10,000-\$58,000	12
	Multiband Plus	Fixed/4	i960 processor (1); TDM/8	NA	LAN, video, voice		✓	✓	✓												\$4,000-\$14,250	36
<b>Ascom Timeplex, Inc. (201) 391-1111</b>	<b>Synchrony family</b>	<b>Chassis/80</b>	<b>Frame relay/1.9G</b>	<b>15</b>	<b>LAN, SNA, video, voice</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>1,000+</b>				<b>✓</b>					<b>\$3,200-\$288,000</b>	<b>3</b>
Cascade Communications Corp. (508) 692-2600	B-STDx 8000/9000	Chassis/1,680	Cell switching/1.2G	14	LAN, SNA, video, voice	✓	✓	✓	✓	✓	✓	No limit		✓			✓				\$30,000-\$65,000	3-12
Gandalf Systems Corp. (800) 426-3253	2050 Network Communications Server	Chassis/12,000	Cell switching/1.2G	(2)	LAN, SNA, video, voice		✓		✓			200		✓			✓	✓			\$30,000-\$400,000	12
	2120 Access Concentrator	Chassis/16	TDM/2M	4	LAN, SNA, video, voice				✓								✓	✓			\$2,495-\$8,500	12
	2300 Access Concentrator	Chassis/4,000	TDM/35M	(3)	LAN, SNA video, voice		✓		✓			200		✓			✓	✓			\$8,000-\$250,000	12
Larscom, Inc. (408) 988-6600	Mega-T	Fixed/5	TDM/6M	NA	LAN, SNA, video, voice		✓		✓								✓	✓		✓	\$8,250-\$9,950	24
	Orion 4000	Chassis/58	(4)	12	LAN, SNA, video, voice	✓	✓	✓	✓	✓	✓			✓			✓	✓		✓	\$20,000-\$76,000	24
Netrix Corp. (703) 742-6000	#1-ISS	Chassis/4,000+	Frame relay/24M; packet/13M; TDM/64M	19	LAN, SNA, video, voice		✓	✓	✓		✓	200					✓	✓		✓	\$20,000-\$750,000	12
Network Equipment Technologies, Inc. (415) 366-4400	IDNX/Micro 20	Fixed/525	TDM/32M	NA	LAN, SNA, video, voice		✓	✓	✓		✓	No limit					✓	✓		✓	\$9,400	12
	IDNX/20 family	Chassis/772	TDM/32M	23	LAN, SNA, video, voice		✓	✓	✓		✓	No limit					✓	✓		✓	\$9,000-\$17,000	12
	IDNX/90	Chassis/2,916	Frame relay/256M; TDM/256M	96	LAN, SNA, video, voice		✓	✓	✓		✓	No limit					✓	✓			\$59,200-\$221,000	12
Newbridge Networks, Inc. (800) 343-3600	3600 MainStreet	Chassis/1,536	TDM/64M	8	LAN, SNA, video, voice		✓	✓	✓								✓	✓			\$10,000-\$60,000	14
	3645 MainStreet	Chassis/12,288	TDM/512M	8	LAN, SNA, video, voice		✓	✓	✓												\$40,000-\$200,000	14
<b>Northern Telecom, Inc. (800) 466-7835</b>	<b>Magellan Passport 50 and 160</b>	<b>Chassis/112</b>	<b>ATM/1.6G</b>	<b>16</b>	<b>LAN, SNA, video, voice</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>(5)</b>	<b>✓</b>	<b>✓</b>			✓	✓			<b>\$9,000-\$200,000</b>	<b>3</b>
OnStream Networks, Inc. (800) 477-7585	BMX45 Broadband Bandwidth Manager family	Chassis/92	TDM/45M	14	LAN, SNA, video, voice		(6)		✓			(7)	✓	✓	✓		✓	✓		✓	\$18,000-\$85,000	12
	CellStream CS600 ATM Access Concentrator	Chassis/25	ATM/400M; cell switching/400M	4	LAN, video, voice	✓	✓					300					✓	✓	✓	✓	\$15,450-\$60,000	12
Premisys Communications, Inc. (510) 353-7600	Integrated Multiple Access Servers	Chassis/90	TDM/2.048M	9	LAN, SNA, video, voice		✓	✓	✓					✓	✓		✓	✓		✓	\$3,500-\$35,000	60
<b>StrataCom, Inc. (408) 294-7600</b>	<b>BPX</b>	<b>Chassis/19,000</b>	<b>Crosspoint/9.6G</b>	<b>271</b>	<b>LAN, SNA, video, voice</b>	<b>✓</b>	<b>✓</b>		✓	✓		<b>200+</b>			✓		✓	✓			<b>\$26,500-\$100,000+</b>	<b>3</b>
	<b>IGX</b>	<b>Chassis/7,000</b>	<b>Cell switching/1.2G</b>	<b>30</b>	<b>LAN, SNA, video, voice</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>			<b>200+</b>			✓		✓	✓			<b>\$22,500-\$100,000+</b>	<b>3</b>
	<b>IPX</b>	<b>Chassis/1,320</b>	<b>Cell switching/32M</b>	<b>30</b>	<b>LAN, SNA, video, voice</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>	<b>✓</b>			<b>200+</b>			✓		✓	✓			<b>\$15,000-\$100,000+</b>	<b>3</b>
Telco Systems, Inc. (510) 490-3111	Access 25	Fixed/6	TDM/512K	NA	LAN, SNA			✓	✓									✓			\$3,000-\$5,000	60
Teleos Communications, Inc. (908) 544-6432	Desktop Video Access Switch	Chassis/21	Packet/256M; TDM/64M	3	LAN, SNA, video, voice			✓	✓									✓			\$14,000	12
	Enterprise Access Switch	Chassis/156	Packet/256M; TDM/64M	19	LAN, SNA, video, voice			✓	✓									✓			\$24,000-\$110,000	12
	Multi Access Switch	Chassis/44	Packet/256M; TDM/64M	6	LAN, SNA, video, voice			✓	✓									✓			\$9,500-\$40,000	12
	Video Router	Chassis/21	Packet/256M; TDM/64M	3	LAN, SNA, video, voice			✓	✓									✓			\$19,995-\$40,000	12
Teillabs Operations, Inc. (800) 445-6501	Portspan 1000B	Fixed/4	TDM/4.2M	NA	LAN, SNA, video		✓	✓			✓							✓			\$4,900-\$7,750	12
	Portspan 1000P	Fixed/2	TDM/4.2M	NA	LAN, SNA, video		✓	✓	✓		✓							✓			\$5,500-\$17,750	12
	Portspan 2000	Chassis/32	TDM/16M	19	LAN, SNA, video		✓	✓	✓		✓							✓			\$8,000-\$75,000	12
U.S. Robotics (800) 877-2677	Total Control Enterprise Network Hub	Chassis/256	Frame relay/2.04M; packet/1G; TDM/16M; X.25/256K	17	LAN		✓	✓	✓		✓	400		✓			✓	✓		✓	\$8,000-\$60,000	24

Products highlighted in color were selected for the Short List.

Footnotes:

(1) Processor bus is clocked at 25MHz.

(2) 18 cards per shelf with a maximum of 224 shelves.

(3) 16 cards per shelf with a maximum of 64 shelves.

(4) Four buses can carry ATM or TDM traffic with maximum speed of 620M bit/sec.

(5) Dynamic bandwidth allows oversubscription according to user needs.

(6) Frame relay traffic is transmitted over leased lines.

(7) Dynamic bandwidth allows TDM-based oversubscription.

NA = Not applicable

Chart compiled by Kathy Scott



public net services. Like data applications, voice applications are intermittent in nature and include conversations that have big bursts of speech and periods of silence.

A bandwidth manager with dynamic allocation can interleave voice and data traffic by allocating one application's unused bandwidth to another. A prioritization scheme can give first crack at bandwidth to private net voice traffic that will not tolerate any delay caused by being interleaved with data. Data applications are less delay-sensitive and don't mind waiting for bandwidth.

StrataCom, Inc.'s IPX and IGX include such capabilities. The products support a mix of voice and data traffic over frame relay, leased lines or ATM network services.

Even when used to support a private leased-line network, the products use a cell relay backbone protocol to make sure capacity is efficiently allocated to each application.

StrataCom pioneered this concept for use in private networks and was an early player in the development of public frame relay and ATM services. It offers

voice compression and silence suppression to make sure voice applications use bandwidth most efficiently.

Ascom Timeplex's Synchrony and Northern Telecom, Inc.'s Magellan Passport 50 and 160 also offer those features.

Other valuable features of Nortel's products are their ability to support echo cancellation and modem/fax detection, which together enable them to integrate analog modem and fax calls with other voice and data transmissions to get even better bandwidth utilization. The product supports voice over an ATM real-time variable bit rate (VBR) service, which economizes bandwidth.

A VBR service only allocates the appropriate amount of bandwidth for applications when it is needed. Most ATM switches transmit voice using a constant bit rate service, which dedicates a chunk of bandwidth to voice traffic and operates like a private line.

When you throw desktop video, room-based videoconferencing or broadcast-quality video into the mix, you'll want to consider a bandwidth manager that can support ISDN, leased

lines or ATM. Video requires a broad range of WAN connections that can be directed to multiple locations at different speeds on a call-by-call basis. ISDN has the inherent characteristics needed to address the pay-as-you-go and bandwidth requirements for videoconferencing.

When selecting a bandwidth manager that supports video applications, look for the ability to select a service and route calls based on criteria including time of day, location and the amount of bandwidth needed.

Products such as Ascend Communications, Inc.'s Max families and Teleos Communications, Inc.'s Enterprise Access Switch can deliver bandwidth on a pay-as-you-go basis with ISDN. Multiple ISDN channels also can be bonded together using an inverse-multiplexing technique if the applications need higher aggregate bandwidth.

Teleos offers video hubs and access switches that add yet another level of sophistication by providing the capability to set minimum bandwidth reserves or maximum allocations for various traffic types across leased lines or switched data services. This lets you manage each application's performance and ensure that the bandwidth-hungry one can't hog all the network resources.

## The LAN/WAN interface mix

How a bandwidth manager supports LAN traffic is a critical factor if you have multiprotocol

data applications. If that's the case, look for a product that can be directly attached to a LAN and has integrated bridging/routing capability. Also, be careful to examine whether the product has roots in the router or mux market.

## Keep cost low on list

► When weighing the relative importance of **bandwidth manager selection criteria**, cost should be fairly far down the list because product cost can quickly be gained back in added network efficiency.

► A **onetime expenditure** in equipment that better utilizes WAN services could **reduce your monthly recurring network costs by several percentage points**. In fact, you could gain back your entire investment in the first year, so **don't let the initial sticker-shock turn you off**. Instead, look more closely at the feature and function mix to guarantee the product you choose will make sure the bits of bandwidth you pay for don't go unused.

There is increasing debate about where to draw the line between bandwidth managers and routers (see story, page 52). The two technologies are beginning to converge as bandwidth managers that are follow-ons to TDM multiplexers add integrated routing capabilities and router manufactures work to support voice, packetized video and switching.

Router-based bandwidth managers obviously are more

likely than products with multiplexer backgrounds to have direct LAN attachments.

However, Ascend's Max families, Nortel's Magellan Passport 50 and 160, Network Equipment Technologies, Inc.'s (NET) IDNX/90 and OnStream Networks, Inc.'s Broadband Bandwidth Manager 45 family — which all hail from the multiplexer crowd — have direct LAN interfaces.

These products also have an integrated router, although the protocols they support are typically limited to the most popular ones, such as DECnet, IPX and TCP/IP.

On the wide-area side, some vendors offer the entire spectrum of transport technologies. An example of this is Nortel with its Magellan Passport 50 and 160, which support private-line, ISDN, X.25, frame relay, SMDS, SONET and ATM functionalities.

About the only thing Magellan Passport doesn't do is bond ISDN channels via inverse multiplexing. Otherwise, the product is quite scalable and has a price tag to match, with a base configuration starting at \$9,000 and going up to \$200,000.

Interworking between WAN technologies also should be on your list of things to consider in a bandwidth manager. Interworking lets locations using different WAN protocols and services communicate. For example, if a product offers frame relay-to-ATM service interworking, a

*Continued on page 52*

## NetworkWorld

## Short LIST

## Bandwidth managers

*The Short List highlights products Network World recommends you examine when purchasing bandwidth managers. Products mentioned here are full-function, highly scalable, provide a wide variety of LAN and WAN features, and support a broad mix of applications. The criteria used to select these products*

*reflects the needs of users with multivendor enterprise networks. Your needs may differ.*

**Ascom Timeplex, Inc.'s Synchrony** family is based on a unified architecture capable of delivering circuit, packet and cell switching. This allows Synchrony to support all types of applications, including SNA and LAN data, voice and video. The vendor recently announced private branch exchange network functionality that provides intelligent voice networking on private nets. The Synchrony family encompasses a range of switches, access concentrators, segment switches and multiplexers. The family also offers multiprotocol routing and standards-based bridging.

**Northern Telecom, Inc.'s Magellan Passport 50 and 160** are good solutions if you need to integrate voice, video and data applications. The Passport products have an Asynchronous Transfer Mode-based switching architecture with integrated frame and cell transport capabilities. Frame switching ensures bandwidth efficiency for data applications, while cell switching provides the performance required for voice and video applications. It also directly integrates LANs with WANs through an integral router, which supports many LAN protocols.

**StrataCom, Inc.'s IPX and IGX** are multiservice platforms that support ATM, frame relay, ISDN and private lines. They can integrate end-user LAN and voice traffic in one device via LAN and digital PBX interfaces. They also can be used as the basis for a leased-line network, as an intelligent access device to high-speed public digital services such as ATM, or in a hybrid environment that uses both leased lines and public net services. In addition, they offer a logical migration path to broadband ATM services with their frame relay-to-ATM interworking capabilities.

## Users agree that application mix drives selection process

**T**he need to spread high-speed datastreams generated by videoconferencing equipment across multiple ISDN links led Apple Computer, Inc. into the bandwidth manager market.

The biggest criteria for choosing a product were reliability and flexibility, says Robert Fischer, manager of Apple Videoconferencing Network. Apple went with a Teleos Communications, Inc. Enterprise Access Switch because it supports ISDN, Apple's service of choice for video, but is flexible enough to support leased lines if needed.

More flexibility came in the number of ISDN channels the product could carve out, including 384K bit/sec H0, 1.536M bit/sec H11, Basic Rate Interface and Primary Rate Interface on either the user or trunk side of the unit. The Teleos product also bonds multiple low-speed ISDN channels together to support a high-speed videoconference.

At Evolving Systems, Inc., a software developer in Englewood, Colo., the ability to add and subtract bandwidth for various applications at will was a major factor in choosing a bandwidth manager, says Dave Twinam, network manager at the firm. The company also wanted to retain time-

division multiplexing, which would work across its Synchronous Optical Network (SONET)-based backbone.

OnStream Networks, Inc.'s BMX45N Broadband Bandwidth Manager gave Twinam what he needed. The BMX45N provides access to OC-3 circuits and can enable packet-based traffic such as frame relay to zip across SONET-based networks. He is evaluating Asynchronous Transfer Mode for a campus net and, eventually, for use across a WAN.

Support for remote LAN access over a variety of WAN services is what drove Tandem Computers, Inc. to buy a bandwidth manager. The firm uses a member of Ascend Communications, Inc.'s Max family to provide bandwidth as needed to users calling in from remote sites, says Bill Brasuell, network technologist at Tandem.

"It will do modem dial-in, ISDN and frame relay all in one box," Brasuell says. Moreover, the unit can give more bandwidth to an ongoing ISDN call. A net manager simply sets a utilization threshold for a call. Once that threshold is hit, another ISDN channel is activated to handle the extra demand and deactivated when demand lessens.

*By Liza Henderson and Beth Gage*



Continued from page 51

using frame relay can communicate with devices that use ATM.

This can be useful in aggregating low-speed frame relay traffic from remote locations to a high-speed ATM connection at the headquarters.

Cascade Communications Corp.'s B-STDx 8000/9000 was one of the first switches to support frame relay-to-ATM service interworking. In addition, it is recognized as one of the most cost-effective data switches on the market. StrataCom's BPX, IGX and IPX also support the feature.

X.25-to-frame relay interworking is available on Ascom Timeplex's Synchrony family and NET's IDNX family. This is particularly suitable when interconnecting international sites that may predominantly use X.25 to communicate with frame relay-based locations in the U.S.

Other bandwidth managers, such as OnStream Networks' BMX45 Broadband Bandwidth Manager family, opt to make the most of a private-line network, rather than worry about service interworking. Both OnStream Networks products offer dynamic bandwidth allocation using traditional TDM over leased lines.

Dynamic bandwidth allocation is typically associated with switched broadband technol-

ogies such as frame relay and ATM.

But OnStream Networks products enable you to set a minimum and maximum bandwidth in 1.5M bit/sec increments for each application, making it possible to transmit frame relay traffic over a T-1 chunk of a larger leased line, such as a T-3.

OnStream Networks' products automatically allocate maximum bandwidth to each application. As a trunk reaches capacity, bandwidth increments are reduced to accommodate each new application until minimum levels are reached.

Conversely, bandwidth increments are increased to maximum limits as other applications are deleted and more bandwidth becomes available. Bandwidth and circuits can be automatically changed based on the time of day, week or month to meet specific network traffic profiles.

Products such as these provide enough to keep you from caving in to the pressure of migrating a leased-line network to public broadband services. Indeed, you should stop and think before ripping apart that highly reliable private-line network.

But at the same time, don't discount the price and flexibility advantages that public data services can provide just because

you have always used private lines.

One advantage the majority of bandwidth managers share is their ability to provide a migration from one service to another without forcing you to purchase a new platform. Another advantage is the ability to operate hybrid networks that use private and public services as needed.

For example, you could operate a leased-line network between primary locations and use a public frame relay network for connecting to remote offices.

## Interoperability for hybrid nets

When building hybrid nets, most equipment vendors will suggest that you go with one product or product family. However, don't rule out a multivendor scenario if you get a better overall price-to-performance ratio.

Adopting a multivendor strategy enables you to pick best-of-breed products for each location in your enterprise. For example, you may find that small remote locations are best supported by a bandwidth manager that can support ISDN and/or frame relay, while a few larger sites need a product that supports private lines or ATM.

Likewise, remote sites might be best served by a preconfigured fixed-port unit, while central locations may need the scalability and flexibility of a chassis-based model.

The biggest problem with a multivendor solution is the higher network operations costs caused by the need for multiple network management systems, the need to learn many different equipment technologies, and maintaining different escalation procedures to get big problems resolved quickly.

Although all the products listed in the Buyer's Guide chart on page 50 support Simple Network Management Protocol Version 1 or 2, you still will need a mix of vendor management systems to gain access to the customized features of each one.

Some of these customized features include setting minimum and maximum bandwidth, device configuration, interpretation of raw SNMP data and suggestions for troubleshooting.

Management is not the only area where vendors will offer customized features. In fact, you can have a significant impact on the custom features that vendors offer by influencing their development.

Give vendors an indication of what you need, by when and how much you're willing to pay. You'll find they're hungry for this type

of information and will bend over backward to accommodate you.

If you have the time to invest and you're willing to take a risk, consider volunteering as a beta-test site.

If you're not in the mood to influence development, sit back and wait to see what the vendors do on their own because they'll be doing plenty. Vendors are constantly developing new features to outdo competitors. There's always a race to become the first to announce a state-of-the-art capability. Once a vendor makes an announcement or delivers on new capabilities, there's almost always a mass of succeeding announcements about a similar capability or one that purports to leapfrog the first.

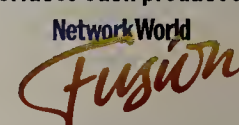
Whatever you do, though, make sure the vendor you select complies with applicable standards down the road. Choosing a single vendor platform may be the best solution today. But you can expect standards to come

along that will make it easier to mix and match products from different vendors that can open doors to a whole new world of bandwidth management.

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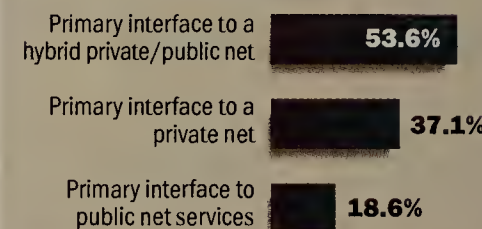
Find out more about the products listed in the Buyer's Guide chart by visiting Network World Fusion at <http://www.nwfusion.com>. After you log on, select NetRef then Buyer's Guides and you'll have access to the type and number of interfaces each product offers.



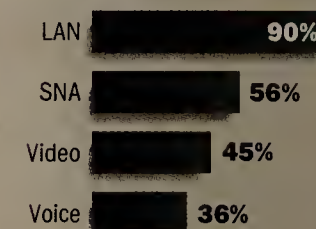
## Reader views on bandwidth managers

Based on 100 interviews.

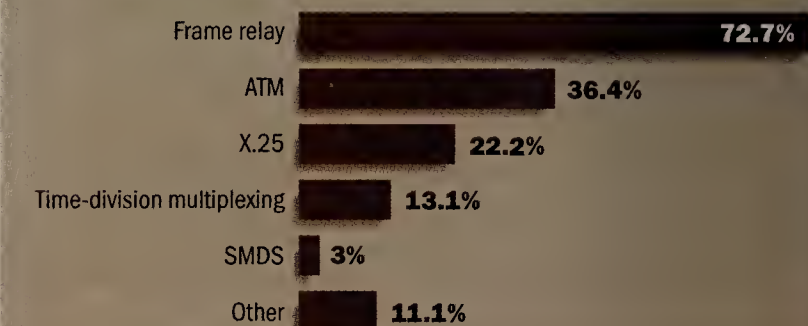
### Bandwidth manager deployment



### Traffic supported



### WAN technologies supported



### Advice for today's buyers

- Understand the applications you're implementing and the networks you're using. Make sure the box is easily adaptable to those applications and networks. Otherwise, you'll spend a lot of money to adapt the box to a changing network architecture.
- Set up your applications before proceeding to see if there will be any problems with the products you evaluate.
- Configuration is a lot tougher than advertised. So know what your implementation plans are before selecting.
- Wait for standards. There are a lot of loose, ad hoc standards put forth by manufacturers, but there are no solid interoperability standards.

*Focus Data, an independent market research firm in Framingham, Mass., conducted this survey. Focus Data specializes in gathering primary data from end-user organizations regarding their enterprise network environment and needs. For more information about Focus Data services, send E-mail via the Internet to [mdabbon@focusdata.ultranet.com](mailto:mdabbon@focusdata.ultranet.com) or call Mona Dabbon at (508) 626-2556.*

## Router vendors take aim at bandwidth manager market

The latest section of the vendor community to shoehorn its way into the bandwidth manager market is the router makers.

Bay Networks, Inc., known for its expertise in LAN bridging/routing and multiprotocol data networking, is going to great lengths in saying it has outfitted its products with switching and bandwidth management capabilities.

Bay says users can transform its Access Stack Node and Backbone Concentrator Node families of routers into bandwidth managers via its Broadband Network Access Switch (BNX) software. BNX software is designed to enable the Access Stack Node and Backbone Concentrator Node to act as a hybrid router/switch, making it possible to route or switch incoming traffic.

Other major router vendors could probably claim similar capabilities. CrossComm Corp., for example, is presenting its XLT Router Family as bandwidth managers because the products have the ability to route or switch LAN traffic.

If your primary need is to support LAN or SNA data traffic only, you might consider looking at router vendors in addition to more traditional bandwidth managers to aggregate traffic and allocate shared network resources.

By Liza Henderson and Beth Gage



# Pleased to meter you

**These software metering  
applications are the polite  
way to stay on top of  
licensing requirements.**

By Kristin Marks

Nobody wants to pay for what they don't use, and in the network-building business, you've got to budget carefully for what you do use. Software metering applications address both concerns, making them an integral part of a net manager's toolkit.

We looked at four high-end stand-alone metering applications: Express Systems, Inc.'s Express Meter, McAfee's SiteMeter, ON Technology, Inc.'s SoftTrack and Tally Systems Corp.'s CentaMeter. All of these products have some features in common — for example, they can all meter server-based applications with Windows clients — but none work the same way because there is no standard architecture for metering yet. A Licensed Server API is under development by Novell, Inc. and Microsoft Corp., among others.

If you want best of breed, have

little time and require license management for local and network applications, focus your attention on Express Meter. It stood above the other products we looked at, with autodiscovery features, built-in optimization and useful reports.

CentaMeter is a good, reliable package with some sophisticated features, while SoftTrack is the solution if you are managing clusters of servers and all your metered applications are server-based.

We found SiteMeter, despite an improved interface, to be highly troublesome when it came to performing the metering it was designed to do.

Those of you with simpler needs, stay tuned: Next week, we'll look at two lower end products — Funk Software, Inc.'s AppMeter and Horizons Technology, Inc.'s LANrecord.

## Express Meter

Express Meter from Express

Systems is the most sophisticated metering program we examined, with lots of features that just aren't available in the other products.

Express Meter employs the unique concept of an application library from which applications are "checked out" and where information is stored about the applications you own and their usage to date. All stations being metered must have access to the server on which the library resides. Multiple server support is handled either through Express Meter's hooks into Microsoft's Systems Management Server (SMS) for Windows NT or the new platform-independent edition for NetWare and other networks.

After installing the program, you can forget about it for a couple of weeks while it starts auditing application usage on your network. As applications are launched, Express Meter adds them to the library list. You can later enter the number of licenses you own and specify whether you want to use permis-

sive or lockout metering.

You define software suites such as PerfectOffice and Lotus SmartSuite by collecting recognized applications. The most popular suites and applications come defined in the application library, complete with list prices already entered in a handy cost field. You only need to let Express Meter know how many licenses you legally own.

One of the stand-out features of Express Meter is the ability to calculate how much money you can save on licensing fees with a Savings Meter report that compares your actual license usage against the total cost of all the licenses identified. A Software Publishers Association compliance report displays exceeded license counts with purchase recommendations (see Figure 1).

You can adjust some of the parameters of these reports. For example, you can specify how long you are willing to let users wait for an application, or declare that no waiting time is tolerable and let the report program generate recommendations for additional purchases.

Express Meter handles VIP users differently than the other programs tested. When a VIP user is notified that he has launched an application for which all the licenses have been checked out, he can press <Alt-V>, enter a password and launch another instance of the application. One password works for all applications in a library.

**OINK, OINK**  
A license hog is a user who can't stand being denied access to an application and, consequently, launches every application he might use in a day when he first logs on. He may not ever actually use the application, and he prevents others from checking it out. The ability to detect the lack of activity and to gently remind a license hog to release an unused license is a license optimization technique.

Express Meter log files tend to grow over time. You can export all the data to most standard formats, including the Desktop Management Task Force's Management Information File (MIF), and reset the log files to recover space or increase reporting speed. SMS can read MIF files and report on the information.

Express Meter ran through our tests with flying colors. Some more distinguishing features are the ability to meter OLE 1 and 2 objects, provide audit reports for changes to the library and meter different versions of applications without a lot of extra configuration. The inclusion of a 32-bit NT client and a wide range of graphical reports are other pluses. The

Continued on page 54



Figure 1: Top, Express Meter shows the most vital metering information in a Savings Meter screen. Bottom, it calculates savings for each application, helping the net administrator plan budget requests and justify product purchases.



Continued from page 53

One thing we don't like is the inconsistent index in its manual.

We tested Version 3.0 of the product. Version 3.1, due out this month, ships with 32-bit Windows 95 support.

### SiteMeter

McAfee's SiteMeter Version 5.1 ships on CD-ROM. New features supported in the release include local metering for Windows applications; a preconfigured list of metered applications; Simple Network Management Protocol traps; support

To define licenses, you click on the Meter button, which brings up a dialog box listing currently metered applications. This is a list of applications sent with the product; it bears no relationship to what is actually installed on your network. To add one of your real applications, you click on the Add button and type in an application name that serves as a description. The rest of the interface is clear, with ample browse buttons to find the files you want to meter, but there is no context-sensitive help.

The Windows interface has improved greatly over previous versions but could still use some work. For example, selecting multiple items on the currently metered applications screen doesn't work, forcing you to select each of the predefined applications, click Delete and verify the deletions one at a time.

Defining suites is the same process as defining single applications, except that you include

for the Xbase database format (instead of Btrieve); and NetWare Directory Services, which means you no longer need to run in bindery-emulation mode.

The administration desktop where you run the console must be running Windows 3.1 or Windows for Workgroups 3.11. Because the program makes some API calls via the NetWare shell, you need to make NetWare your primary network client.

all the executables in the suite in the same license definition. SiteMeter does not have dynamic suite allocations. In fact, you can't define a license for Word alone and then include the same executable as part of an Office license definition. Each program file can be licensed only once. The lack of single/suite license allocation features sets it behind Express Meter and CentaMeter.

Another feature lacking in the product is license inactivity reclamation. If a license hog starts up several applications but minimizes them and doesn't use them all day long, SiteMeter can't alert you to that fact.

A nice feature is implemented on the usage graph: As you drag your mouse pointer over active connections, additional detail menus become available, displaying active users and users waiting in the queue.

Despite hours spent with some of the best technical support people we've encountered this year, we could never make SiteMeter track license usage on the same servers we used for the other products. We could define licenses, run agents and review sample data, but we could not check to see if the product actually worked.

McAfee sent us a server they configured, which yielded slightly better results. We found DOS applications were metered properly and server-based Windows applications were properly registered. Defining licenses for local applications went smoothly, but again, local usage wasn't accurately tracked.

Small quirks continue to concern us. For example, SiteMeter's own console reported that its NetWare Loadable Modules weren't running, but a quick check using the Modules command at their server's console as well as a check of memory allocations using the Monitor NLM showed

SiteMeter's NLMs were loaded. We believe they were running because metering was taking place.

While SiteMeter's interface is improving with each revision, we question its robustness.

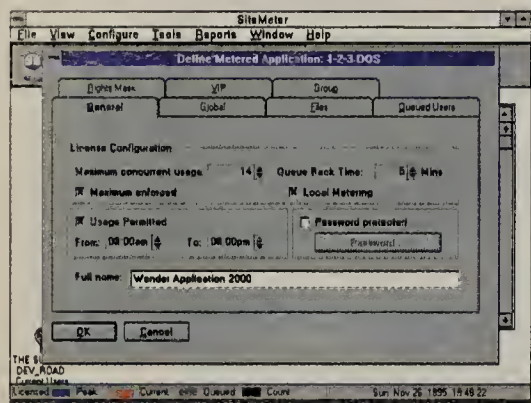
### SofTrack

SofTrack Version 2.50a from ON Technology is a practical solution for the experienced NetWare administrator. If you know your way around a file server, you'll appreciate SofTrack.

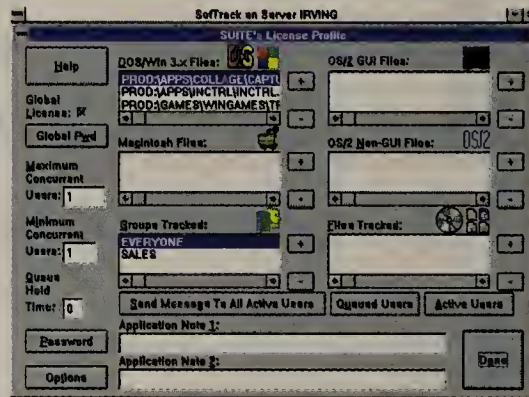
The product runs as an NLM only, with no TSRs or agents on the desktop. But since SofTrack doesn't meter locally launched applications, it doesn't need them.

A case could be made that you don't need to meter locally installed applications but simply count them. However, be careful: Unless you've got all your applications running on a server, you may not have enough information to optimize your license

*Continued on page 56*



**Figure 2:** License definition setup is easy to do in SiteMeter. On this screen, you tell SiteMeter how many licenses you own and enter enforcement and queuing parameters, as well as allowed usage times.



**Figure 3:** SofTrack lets you set up multiplatform license tracking on a single screen, which is especially useful for heterogeneous environments with site licensing agreements.

## HOW WE DID IT

For each product, we defined single licenses for three server-based Windows applications, then used the same three license definitions as part of a suite. We checked enforcement by logging on to one more workstation than the number we had defined, and evaluated queuing mechanisms and messages. Next, we had one workstation launch a second application of the suite to see if the single license would be swapped for a suite license. We also tested local applications with the products that support them.

We checked DOS application metering from the system prompt before Windows was started and from inside a Windows DOS box. Our Windows workstations ran Windows 3.1, Windows for Workgroups 3.11 and Windows 95.

To test license reclamation, we rebooted workstations running metered applications to see if the metering program would recognize that the license was no longer in use. For more sophisticated inactivity tests, we minimized metered applications and left them inactive.

To check on each product's ability to handle users, we created a NetWare group and tried to restrict application usage to just the users in it. We also defined a VIP user to make sure important users could access designated applications, even without available licenses.

One test server was a Micronics 33-MHz 486 with 24M bytes of RAM and Thomas-Conrad EISA and Standard Microsystems Corp. ISA LAN boards running NE2000 drivers. The disk controller was an Adaptec 1740. A second server was a 66-MHz 486 clone with 8M bytes of RAM and a 3Com Corp. EtherLink II LAN card. Both servers ran NetWare 3.12.

The test workstations ran on J&L Chatterbox NRS 66-MHz 486 boards with 8M bytes of RAM.

The Windows 95 workstation is a Dell Dimension XPS 466 with 16M bytes of RAM.

Because McAfee's SiteMeter failed to perform adequately on the same machines as the other products, we used an additional third server supplied and configured by the vendor to test it.

## NetResults

Product	Express Meter 3.0	SiteMeter 5.1	SofTrack 2.50a	CentaMeter 2.5
Vendor	Express Systems (206) 728-8300	McAfee (408) 988-3832	ON Technology Corp. (800) 767-6683, (617) 374-1400	Tally Systems Corp. (800) 262-3877, (603) 643-1300
Sample prices	\$10 to \$30 per workstation	\$535 for 1-25 nodes; \$17,900 for 1,001-1,250 nodes	\$495 for up to 50 users; \$3,995 for 501 to 1,000 users	\$175 for 5 users; \$9 per node for 1,000 to 1,499 users
Pros	<ul style="list-style-type: none"> <li>▲ Best collection of built-in optimization reports.</li> <li>▲ Least amount of administrative setup work.</li> <li>▲ Autodiscovers application setup.</li> <li>▲ No NLM or TSRs.</li> <li>▲ Integrates with SMS.</li> <li>▲ Good multiple server support.</li> </ul>	<ul style="list-style-type: none"> <li>▲ Lets licenses follow the sun by transferring licenses as requested to multiple servers.</li> <li>▲ Integrates with other McAfee products.</li> </ul>	<ul style="list-style-type: none"> <li>▲ Multiple platform support makes license definition easy.</li> <li>▲ Well integrated with NetWare.</li> <li>▲ Easy configuration of license definition.</li> <li>▲ Dynamic license pooling among multiple NetWare servers.</li> </ul>	<ul style="list-style-type: none"> <li>▲ Surprisingly feature rich.</li> <li>▲ Good license reclamation.</li> <li>▲ Good list of predefined applications for accurate metering.</li> <li>▲ Strong query function allows queries to be saved.</li> <li>▲ Improved reports.</li> <li>▲ Integrates with SMS and other Tally products.</li> </ul>
Cons	<ul style="list-style-type: none"> <li>▼ None significant</li> </ul>	<ul style="list-style-type: none"> <li>▼ Install is unnecessarily complex, requiring many manual steps by administrator.</li> <li>▼ Unreliable results in our lab.</li> </ul>	<ul style="list-style-type: none"> <li>▼ Only meters server-based applications.</li> <li>▼ Unnecessary error messages should be handled by the program.</li> </ul>	<ul style="list-style-type: none"> <li>▼ Some manual steps should be automatic.</li> <li>▼ Limited multiple server support.</li> </ul>



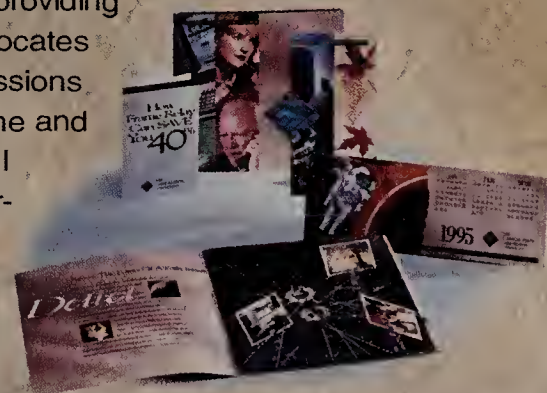


Leap to increased network capabilities at a lower cost. Compare EMI Frame Relay to traditional leased lines and you'll find greater network integrity, speed, efficiency, and throughput for your LAN-to-LAN and SNA data transmission applications. Buy just the right amount for your needs and save up to 40% of the cost of using leased private lines. **An integrated networking solution.** EMI's Frame Relay wide area packet data network consolidates all your networks into a single, cost-effective network. Offering you a solution that provides for multi-protocol transport, diversity, and redundancy, with technology that's migratable to ATM. **Count on more switches for smoother data flow.** EMI

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Frame Relay creates your information highway, with numerous alternate routes to avoid traffic delays. A high density of switches per region, with multiple switchable trunk paths, allows instant rerouting for smooth transmission of your critical data. **Create an overall savings network.** Instead of providing too much or too little bandwidth, EMI Frame Relay dynamically allocates exactly the right amount of bandwidth in real time as your transmissions need it. You'll see the difference in substantial overall savings in line and administration costs. **Jump to it and start saving today!** Call EMI and cash in on the benefits of Frame Relay. With enhanced performance, simplified management, and savings up to 40%.

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recognized as one of the top value-added network services in the United States. At the core of EMI is our highly trained staff of problem

solvers, dedicated to a single goal: exceeding the expectations of our customers. We pledge to continually explore the frontiers of advanced communications technology and deliver cost-effective alternatives for your business' critical data needs.



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Continued from page 54  
metering.

SofTrack works on top of NetWare security, not instead of it. For example, you use network operating system groups to specify group license use instead of setting up separate groups. The program is easy to follow and makes good use of screen real estate. But minor user interface issues may stop you, such as when you look for the Done or OK button and realize that the only way out of a screen is through the Windows control box in the upper left corner.

You create license profiles by telling SofTrack which files to meter (see Figure 3, page 54). License profile names can be up to 20 characters in length. The multiple workstation-type boxes in the license profile definition screen let you meter an application regardless of the name of its client executable on different platforms. SofTrack can meter .EXE and .COM files for DOS, Windows and OS/2 applications, as well as Dynamic Link Libraries (DLL) for Windows and Macintosh applications. You can meter data files, as well.

If you specify the complete path, SofTrack tracks who opens and closes that file. If you just specify a file without a path, SofTrack meters it regardless of location. At a minimum, you must specify one executable file.

Many applications these days run a small executable file that loads the rest of the program from another file type, such as a DLL, and then closes the executable while the application is still up and running. This makes configuring metering problematic; if you just meter the .EXE file, it will appear as if your users only run the application for 30 seconds at a time.

ON Technology lists in the manual the actual code files for some of the most popular programs. So to meter WordPerfect Version 6.1, you should meter the file WPWP61US.DLL. If your applications aren't on the list, you can call ON Technology support to verify the correct code file to meter.

If you want to limit metering to a specific group of users, you just select them from a pick list. Selecting a NetWare group to be tracked for license count does

not restrict application usage to that group, however. Anyone else can run the program without being metered. If you want to meter everyone, select NO groups or the default NetWare group EVERYONE.

In the NetWare 4.X environment, SofTrack creates an Organizational Unit (OU) in each server's context, where metering is to take place. License managers need supervisory rights to the SofTrack OU.

One annoying but fixable configuration glitch shows up when you try to access an application with no available licenses. You erroneously receive a "File not found" error message. If you get past that, you get the text message that a license is

not available. Copying a utility shipped with SofTrack called ST—BLOCK.EXE to the SYS:Public directory makes this glitch go away. We wish that this step had been included in the installation process.

On the plus side, SofTrack takes advantage of the NetWare Send utility. All text messages are delivered via Send as a 25th-line broadcast message or in Windows via Nwpopup.

Administrators can edit all of the program's messages, such as "License not available," to make them more friendly. You can set up the meter log file to live anywhere you like. You also can decide how big it can get or how much time should elapse before it archives itself by copying the data to a new file name.

Reporting can be done on all logged metering data, even archived data. One glitch we found was that the graphical reports didn't work for a one-day period. When we upped it to three days, it graphed perfectly, even though we only had data for one day.

#### CentaMeter

CentaMeter from Tally Systems was right between version numbers during our review process. We tested Version 2.0, but 2.5 will be available this month. The biggest improvement looks to be enhanced reporting features to aid in license optimization. Smaller improvements will be in the user interface and ease of configuration.

CentaMeter installs a Windows agent that loads when Win-

dows starts. There is no NLM; Tally prides itself on the wide variety of PC LAN platforms on which CentaMeter runs. It doesn't matter whether the application to be metered is local or network-based as long as the license definition fits.

Setting up applications to be metered is a two-step process. First, you define the applications you want to monitor. Then, under a separate menu choice, you define how many and what types of licenses you have. A pick list of several popular applications is provided. CentaMeter can use more complete application definition fields such as date and executable size range. If you don't specify the fully qualified path, these additional fields help provide version differentiation metering.

Time restrictions, group license allocation and queuing users are all available, but you must enter the data in character strings instead of selecting from

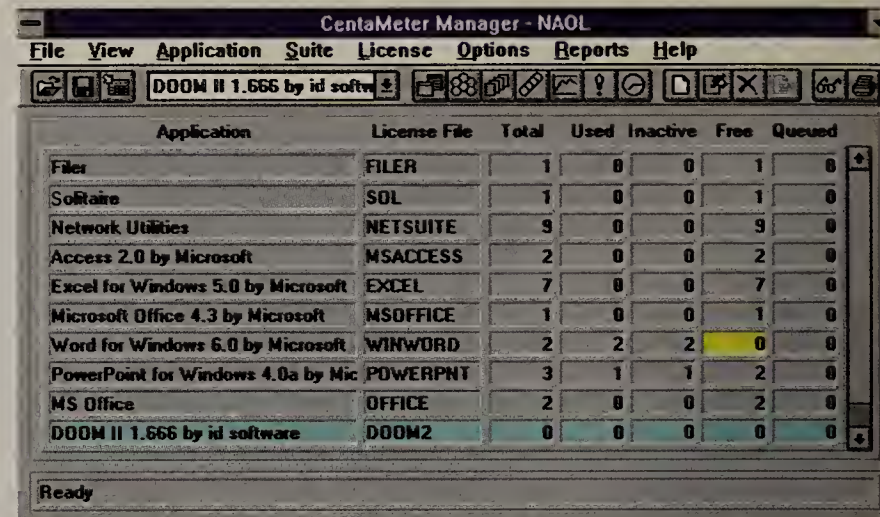


Figure 4: CentaMeter displays real-time usage statistics for each application, including the number of licenses still free and the number of users waiting in queues.

pick lists, as in SofTrack.

Similarly, to restrict users from running certain applications, you need to list them all in a single line field, separated by semicolons.

CentaMeter lacks the ability SofTrack has to group multiple platform applications under a single license count. It does a good job at dynamic suite alloca-

tion and can meter DOS applications as long as they are run in a DOS box under Windows. If you are a Windowless shop, you can use a TSR that ships with the product.

CentaMeter keeps track of license configuration information in two separate files for each license definition. Each time you change the license definition,

#### Metering software features

Product	Express Meter	SiteMeter	SofTrack	CentaMeter
Server component	None	NLM	NLM	None
Administration console	Windows	Windows	Windows	Windows
Console password protected	No	No	No, but each license profile can be password-protected	Yes
Meters DLLs	Yes	Yes, any file	Yes, any file	Yes
Split permissive/restrictive metering by application	Yes	No	Yes	Yes
Multiple server support	Yes, via SMS integration or Platform Independent Support Module	Yes	Yes, global license for license balancing	Yes, via SMS integration
Suite metering	Yes	Yes	Yes	Yes
Single/suite license switching	Yes	No	Yes	Yes
Inactivity tracking	Yes	No	No	Yes
Inactivity reminders	Yes	No	No	Yes, configurable by minutes
License allocation/reservation by group	Yes, <Alt-V> password bypasses license lockout for VIP users	Yes	Yes, by omission	Yes, no pick list; must type in groups or users in license definition box
Queues users requesting unavailable license	Yes	Yes	Yes	Yes
Local application metering	Yes	Yes	No	Yes
Time restrictions for application usage	No	Yes	Yes	Yes
Built-in application list	Autodiscover feature, sample libraries	Yes	No	Yes
Audits changes to the metering database	Yes	No	No	Yes
Client support	DOS, Windows 3.X, Windows 95	DOS, Windows 3.X, Windows 95, OS/2, Macintosh	DOS, Windows, OS/2, Macintosh	DOS, Windows 3.1X, Windows 95, Windows NT
Self-installs for clients	Yes, via login script or command line	No	Not applicable	No
Configuration of single application	Automatic application definition created when any new application is run; license configuration is a couple of clicks	Intuitive, but you still must visit four to six screens depending on the parameters you want to set up	Simple, includes cross-platform support on single definition screen	Simple



you are prompted to flag these files as shareable. Without this manual step, metering won't work properly. This should be done by CentaMeter, despite its goal of NOS independence as a reason not to code this feature.

CentaMeter is good at license reclamation. Because many metering programs just track file opens and closes, if you have three or four applications open and your system crashes, the licenses for the applications you had open at the time of system crash never close. CentaMeter can detect lack of activity and reclaim those licenses.

In addition, CentaMeter, like Express Meter, can detect lack of activity in an application, allowing you to root out license hogs who keep applications open even when they're not in use.

CentaMeter provides a field for entering an application serial number, which makes a lot of sense: If you're shifting to electronic management, why track serial numbers on paper? You can get a report that prints the serial numbers out, which is a lot better than trying to keep a file of all the registration cards.

Notification options include mail notification, which will keep administrators from having to click OK through several Nwpopup messages. The message text is editable.

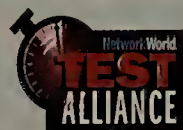
We experienced a couple of system lockups when exiting the management console. Although we made suite licensing work a few times, we experienced occasional inconsistent results. For example, when launching the second application of a suite, the first single license wasn't switched out for a suite license.

The CentaMeter console displays real-time statistics for current, peak and total license usage (see Figure 4, page 56). Applications with no available licenses are displayed in yellow, alerting the administrator that the license limit has been reached. Version 2.5's beta has great analysis reports. With SMS integration features, the new version aims to become an enterprise solution.

#### License summary

Of all the products we looked at, Express Meter is way ahead of the pack. Express Systems has examined the issues that concern administrators and addressed them. The autodiscovery feature cuts down on setup time so significantly that this feature alone is worth the investment. Other features that put it head and shoulders above the pack are the built-in optimization and cost-savings reports.

The alliance is a cooperative of users, consultants, educators and integrators that applies its technical and business skills to analyze and compare strategic network products. A list of alliance partners can be found on page 47.



Marks is a principal of Networks Are Our Lives, Inc., a network consulting firm based in Dutchess County, N.Y. She can be reached at 74002,2411@compuserve.com.

Again, the value to the administrator is time saved.

If you have a diverse desktop environment and only need server-based application metering, SofTrack is a good choice. It is easy to use, can track license usage regardless of platform and employs multiple-server license balancing. This product will be a favorite of longtime NetWare administrators because of the product's developers' innate understanding of the

NetWare operating system.

CentaMeter is a good middle-of-the-road choice — reliable, simple to install and with some useful reports available in Version 2.5. Many of the features, such as time restrictions, group usage and chargeback, are sophisticated but not overwhelming.

SiteMeter showed marked interface improvement and a solid feature set in our lab. ■

Go on-line for installation tips for these products and a comprehensive look at metering tools from the Software Publishers Association. Link to <http://www.nwfusion.com>. Select NetRef, Reviews and Buyer's Guides, then Metering Software.

Champions of Cyberspace

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# Management Strategies

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## Briefs

**Inference Corp.** has teamed with **KnowledgeBroker, Inc.** and **ServiceWare, Inc.** to provide prepackaged knowledge bases to help desk users.

Optimized for help desk software that employs case-based retrieval, the initial suite of products will have content developed by KnowledgeBroker and ServiceWare, and will support more than 25 common desktop products.

Inference will deliver, support and update the suite of products beginning early next year via a newly formed Knowledge Publishing Division. Inference will look to other sources such as its customers, software manufacturers, help desk and customer support outsourcing firms for more knowledge bases to publish.

Inference: (415) 899-0100.

**Future Tech Systems, Inc.** has released *Envision 5.0*, an enhanced version of its organizational modeling software.

The new version can create business models, analyze efficiency and suggest where to reengineer operations to increase productivity. *Envision 5.0* transforms flowchart objects into business objects and stores the relationships in an object-oriented repository. Users then can tap *Envision's* standard and custom-designed shapes, clip art and multimedia to create printable reports.

In addition, the software provides optional simulation technology to add motion and time dimensions to models.

The upgrade includes enhanced analysis and reporting features, such as a custom document formatter, integrated matrix analysis and SQL support. The document formatter can prepare repository diagrams and data for export to other packages, such as word processors and spreadsheets.

Future Tech Systems: (206) 939-7552.

## Cut costs to stave off client/server E-mail move

By Daniel Blum

As you mull over whether to move from a file-sharing to a client/server messaging architecture, don't overlook the seemingly obvious first step of getting a good grasp of how much moola goes into operating your existing electronic mail network.

A study my firm recently completed found that a few well-placed tweaks to the net could drive down costs enough to make examining a client/server architecture less urgent. The savings you can squeeze out of a file-sharing E-mail net depend on its topology and efficiency of use.

### MORE ON-LINE

Visit Network World Fusion to get other E-mail related articles written by Rapport Communication, including a buyer's guide that explains the difference between file-sharing and client/server messaging products, as well as a primer on how to budget for messaging.

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NetworkWorld  
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But it can be expensive. Server functionality is hosted on numerous single-tasking DOS platforms, each post office can support relatively few users, and maintenance procedures for mailbox compaction and directory synchronization are less automated than you'd like.

Furthermore, administrators are required to physically visit a bewildering number of post offices, message transfer agents (MTA) and gateways to perform maintenance operations and make repairs when failures preclude remote machine access.

Then there are the ongoing vendor fees for software maintenance and upgrade, plus the cost of providing staff for routine administrative support.

When figuring the cost for your existing net, the first thing you should do is find out how many servers a single administrator can manage. That number will help to figure the average

number of users an administrator can support and then can be used to calculate support costs.

To determine those numbers, examine your administrative practices. If you've got post offices and MTAs scattered across many sites, with administrative chores assigned to full-time or part-time administrators at each location or rolled into someone else's job description, they could use some tightening.

Also, you're in bad shape if you still have DOS servers that run E-mail on top of other applications and you haven't specified a standard brand of hardware and networking equipment. Ditto if you've failed to specify an enterprise standard E-mail server configuration and allowed the topology to get twisted with rogue connections and backdoor routes into what we call a "ChaosNet," where each administrator can support 100 users.

If you're in the ChaosNet boat, you should standardize and upgrade your post office and MTA platforms to Intel Corp. Pentium- or Reduced Instruction Set Computing-based servers running a multitasking operating system such as Windows NT, OS/2 or Unix.

In addition, you should endow those servers with copious gifts of memory and disk space, and consider consolidating multiple post offices onto a single physical server. These steps can help you centralize administrator reporting structures and standardize administrator roles, responsibilities and procedures.

My company estimates that a typical large enterprise with 15,000 or more LAN E-mail users and an enterprise backbone that adopts these types of best administration practices can expect a ratio of about 500 users to one administrator. Likewise, we figure that such an enterprise will pay about 30% of its annual messaging budget to maintain the integrity of file sharing-based messaging nets. Another 68% of the budget will be chewed up by support costs, and 2% will go toward software maintenance.

Actual results can vary considerably from these ballpark figures. For example, one company

with 6,000 Microsoft Mail users at a single site claims to be operating its network with just three

plification and standardization will help make file-sharing E-mail give next-generation cli-

### E-mail metric measurements

A large enterprise with 15,000 people using an E-mail system based on a file-sharing architecture should:

- ▶ Have an average of two file-sharing post offices per administrator.
- ▶ Make sure administrators spend no more than 12.5% of their time taking care of each post office.
- ▶ Follow the rule of thumb that the staff needed to administer regional or central E-mail hubs should equal 25% of the full-time staff required for LAN E-mail post office administration.
- ▶ Make sure there are five to 10 administrators or engineers to maintain gateways to legacy systems and corporate directories. The actual number depends on the size and complexity of the backbone.

administrators.

But maintaining numerous and varied proprietary mail systems, multiple Internet/public messaging connections, many scattered sites, a weak net infrastructure, decentralized administration, and no server hardware/software standards will increase costs.

Eliminating those costs via consolidation, automation, sim-

ent/server messaging systems a run for their money.

Blum is a principal at Rapport Communication, an electronic messaging consultancy, and coauthor of *Decision '96*, a report that evaluates the next-generation messaging offerings of Lotus Development Corp., Microsoft Corp. and Novell, Inc. He can be reached via the Internet at [dblum@interramp.com](mailto:dblum@interramp.com).

## Five new titles introduce users to hot technologies

By Kathy Scott

A new series of books from McGraw-Hill, Inc. is designed to satisfy your need to know more about Asynchronous Transfer Mode, internetworking, ISDN implementation, message queuing and using TCP/IP in IBM environments.

■ *Introduction to ATM Networking*, written by ATM Forum member Walter Goralski, looks at the fundamentals of building, using and maintaining ATM nets and advanced applications such as broadband data transfers, multimedia and video. It costs \$55.

■ *The McGraw-Hill Internetworking Handbook*, written by D. Edgar Taylor, consultant and lecturer, explains how dominant upper and lower layer network protocols work, as well as how to design and implement addressing. It also describes the devices used to interconnect networks. The publication is priced at \$79.50.

■ *The ISDN Implementor's Guide* is

a three-part tutorial that gives readers a comprehensive look at narrowband and broadband ISDN. Written by Charles K. Summers, vice president of engineering at TeleSoft International, Inc., the book offers implementation and problem-solving strategies, and sells for \$45.

■ *Messaging & Queuing Using the MQI* explains IBM's Message Queue Interface (MQI), middleware that permits distributed applications to interact. The book is written by Burnie Blakeley, Harry Harris and Rhys Lewis, developers of MQI, and it is tagged at \$55.

■ *TCP/IP Networking: A Guide to the IBM Environment* examines how IBM is integrating TCP/IP into its Network Blueprint and its six major platforms. Written by consultant and instructor David M. Peterson, the book also provides readers in IBM shops with an overview of the TCP/IP architecture and sells for \$50. ■











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As part of a very creative and successful team, you will develop software for Remote Access/Wireless LAN products which are part of the Internetworking product family. This includes high-quality designing, implementing and testing of Remote Access Network products. To qualify, you must have a BSCS or equivalent, 6+ years' experience, an understanding of embedded systems and extensive experience in C programming. Knowledge of 68000 programming, network products, PCMCIA, driver development, wireless communication, modems, MIBs and security a plus.

### Principal Software Engineer - Technical Support

Working in a dynamic and fast-paced environment, you will provide pre- and post-sales support on Digital's HUB and LAN products to distributors and resellers. Acting as part of a team of networking experts, you will also provide detailed in-depth engineering product knowledge to the resellers to facilitate their ability to bid and sell HUB and LAN products. To qualify, you must have a BSEE/CS or equivalent and 5+ years' LAN experience. Direct customer experience a plus.

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### Principal Engineer - ASIC Design

You will design and test new network repeater and switch chips (usually CMOS ASICs) for the DEChub 900 organization. This includes gate-level design or synthesis, simulation, timing verification and test vector generation. Lab debug assistance of prototype devices may also be required. To qualify, you must have a BS/MS in EE, logic/chip design experience, and the ability to work independently and provide leadership for small groups. Familiarity with CADANCE designs and an understanding of Ethernet networks and switches highly desirable.

### Software Manager - Remote Access

Acting in both a technical and managerial role, you will manage a highly motivated software team in the development of ISDN-based remote access products. To qualify, you must have a BSCS/EE or equivalent, 10+ years' software development experience (with at least 3 years in management), and direct experience in developing ISDN products. Knowledge of routing/ WAN protocols and security a plus.

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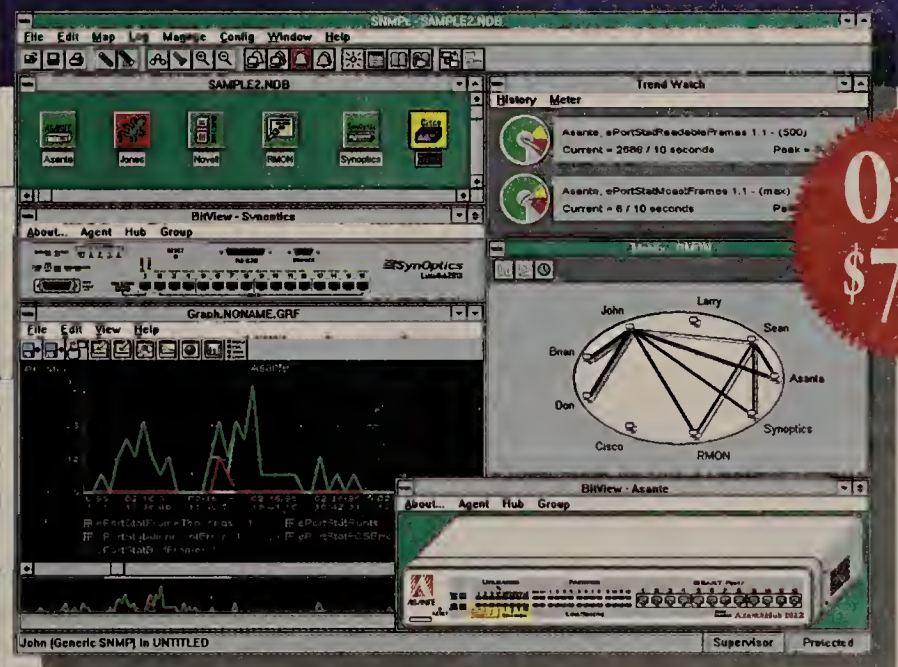
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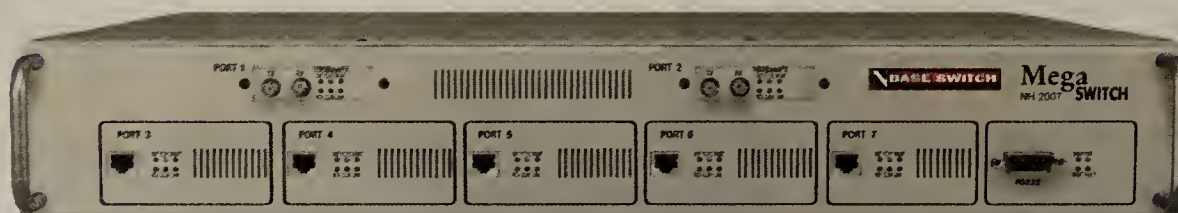
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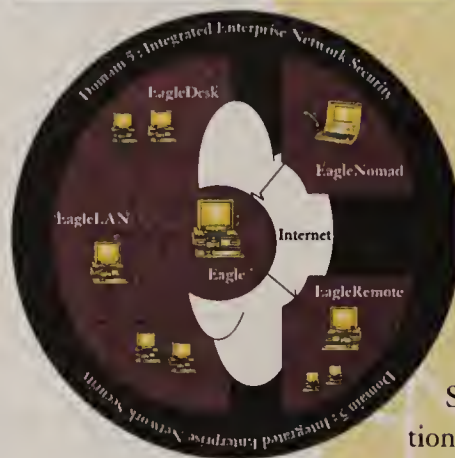
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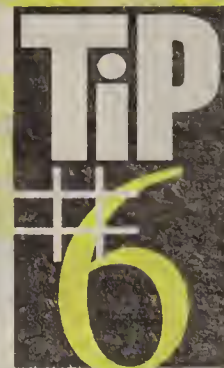
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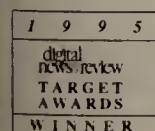
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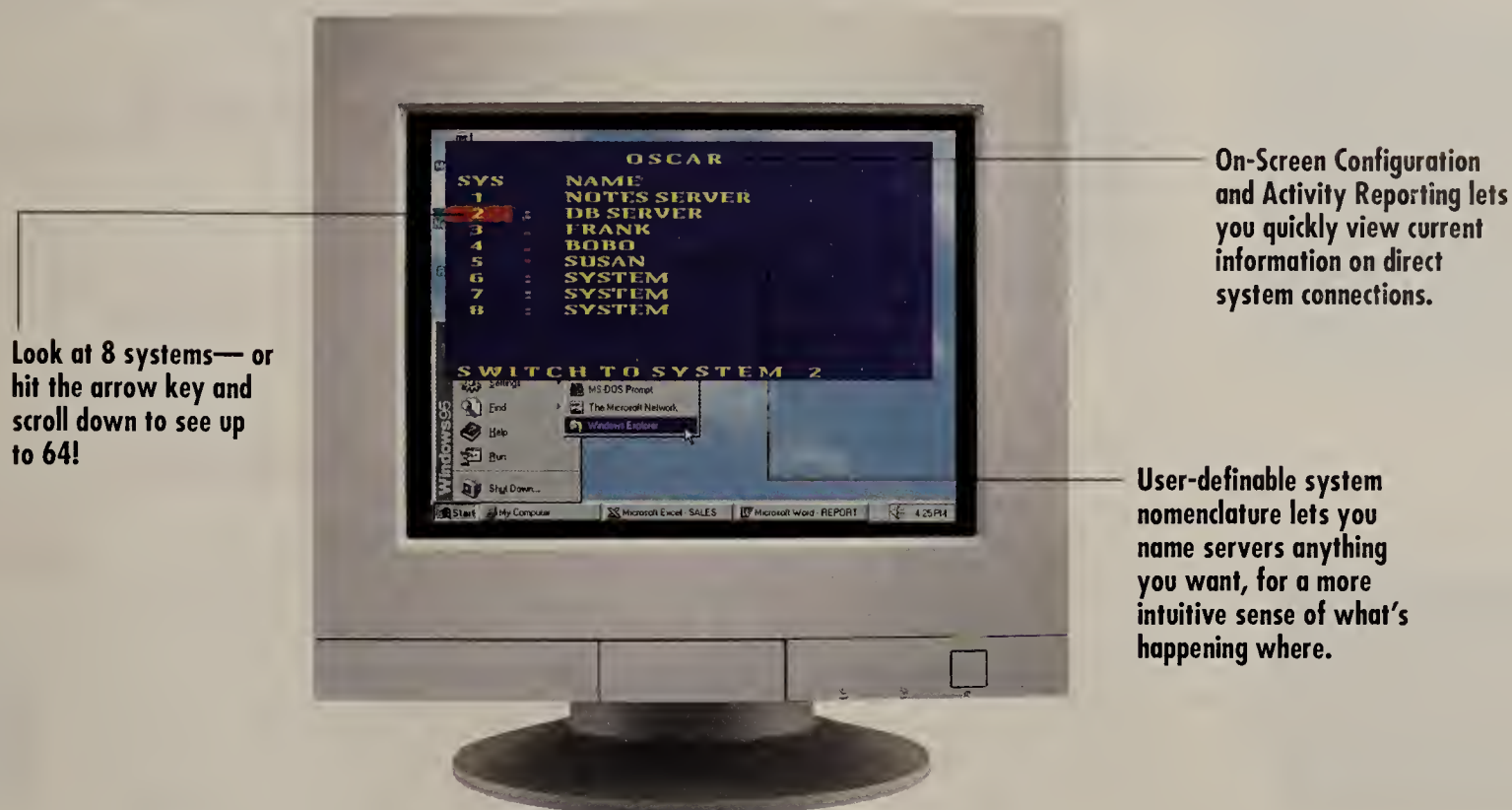


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# 100 Mbps Fast Ethernet and Ethernet Switches

## 100 Mbps Ethernet Switches

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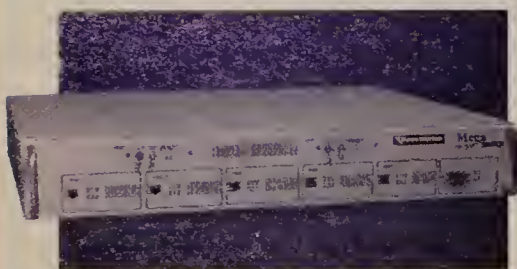
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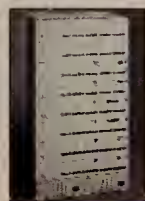
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10/100 PCI (SMC933DST) ..... \$194

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### ASANTE

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### NBASE

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### NETWORTH

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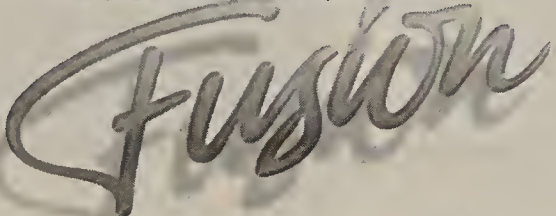
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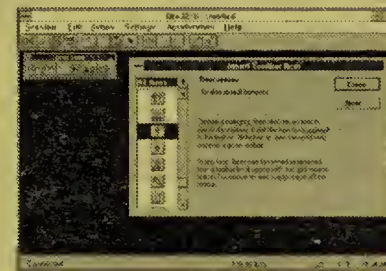
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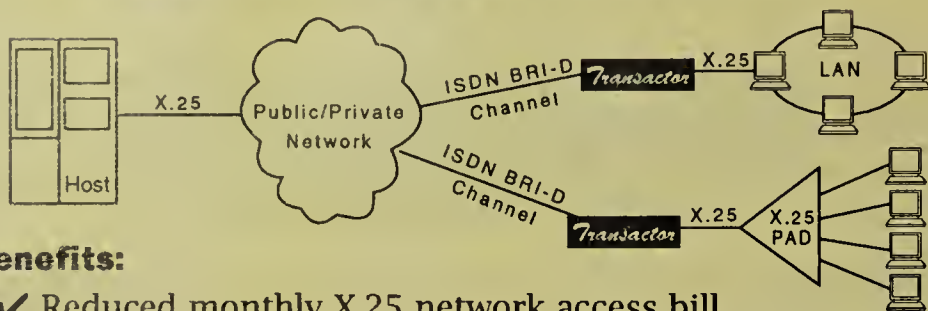
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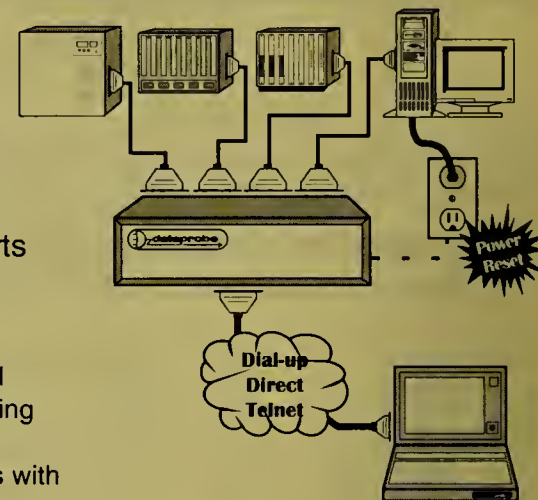
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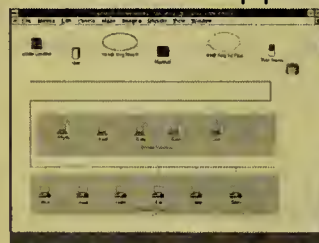
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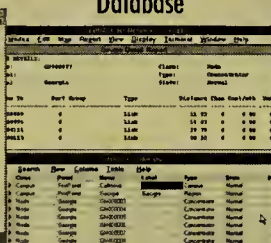
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#### EDITORIAL INDEX

3Com.....	6	Microsoft.....	1,8,12,14,15,28,35,36,46
<b>A</b>		Moai Technologies.....	35
Accton.....	27	Motorola.....	15,22
ADC Kentrox.....	1	<b>N</b>	
Agile.....	46	NEC America.....	15
Ameritech Cellular.....	16	NetFRAME.....	14
ARDIS.....	15	Netscape.....	8
Asante.....	27	Newbridge.....	27
Ascend Communications.....	51	Nortel.....	1,51
Ascom Timeplex.....	6,51	Novell.....	28
Aspect.....	23	<b>O</b>	
AT&T.....	1,6,15	Objective Systems Integrators.....	22
<b>B</b>		ON Technology.....	53
Bay Networks.....	6,10,12,15,52	Online Resources.....	41
BMC.....	36	OnStream Networks.....	51
<b>C</b>		Open Environment.....	36
Cable & Wireless.....	22	Open Horizon.....	12
Cabletron.....	1,10,12,36	Oracle.....	1,35
CellAccess Technology.....	10	<b>P</b>	
Cisco.....	1,10,15,22,30	PictureTel.....	10
Cognos.....	35	Polaris.....	12
Compaq.....	31	Powersoft.....	35
Computer Associates.....	14	<b>R</b>	
Computerm.....	12	RAD Data Communications.....	15
Concord.....	6	RadioMail.....	16
Control Data.....	22	Remedy.....	14
<b>D</b>		<b>S</b>	
Digital.....	31	S2 Systems.....	41
<b>E</b>		SBT.....	41
Express Systems.....	53	ServiceWare.....	58
<b>F</b>		Shiva.....	22
First Virtual.....	10	Silicon Graphics.....	8
Fore Systems.....	10,27,46	Sourcecom.....	12
Future Tech Systems.....	58	Spider Technologies.....	35
<b>G</b>		Sprint.....	22
GTE Mobilnet.....	16	StrataCom.....	51
Gupta.....	36	Sun.....	8
<b>H</b>		Sybase.....	14
HP.....	6,31	<b>T</b>	
<b>I</b>		Tally Systems.....	53
IBM.....	1,6,8,23,31,46	TeamWARE.....	35
Inacom.....	15	Teleos Communications.....	51
Inference.....	12,58	Tivoli.....	36
Informix.....	14	<b>U</b>	
<b>K</b>		US Order.....	41
KnowledgeBroker.....	58	<b>V</b>	
<b>L</b>		Vision.....	36
Lantronix.....	15	Visual Networks.....	15
LCI.....	27	<b>W</b>	
Lotus.....	1	Wang.....	6
<b>M</b>			
Madge.....	30		
McAfee.....	53		

Bandwidth managers Buyer's Guide vendors are listed on page 50.

#### ADVERTISER INDEX

Advertiser.....	Reader Service#.....	Page#	Regionals/Demographics
3Com Corp.....	23		<i>Ads appear in selected issues only.</i>
ACC.....	18		EMI Communications Corp..... 55
Access Media Inc.....	57		Novell Inc..... 44-45
Banyan Systems Inc.....	26		<b>Marketplace Advertiser Index..... Reader Service#..... Page#</b>
Cabletron Systems Inc.....	2-3		ADIC..... 246..... 61
Cisco Systems.....	32-33		Apex PC Solutions Inc..... 266..... 65
COMNET.....	48		Castle Rock Computing..... 252..... 61
Crosscom Corp.....	19		Century Software..... 282..... 63
Cubix Corp.....	76		Compact Devices..... 265..... 64
Digi International.....	24-25		Internet Security Company..... 251..... 64
Digital Equipment Corp.....	17		MaxNET..... 267..... 64
Fore Systems.....	22		NBASE Communications..... 242..... 62
General Datacomm.....	42		NHC Communications..... 230..... 64
Hewlett-Packard.....	20-21,34		Raptor..... 63
IBM.....	9,11,13,38-39,75		TGV Inc..... 261..... 63
Intercon Associates.....	30		West Hills LAN Systems..... 253..... 66
LanOptics Inc.....	28		<b>ActionCenter</b>
Microsoft.....	37		CNT/Brixton Systems Inc..... 109..... 69
NEC Technologies.....	29		Dataprobe Inc..... 112..... 70
NORTEL.....	7		Microtronix..... 110..... 70
Optical Data Systems.....	4		Network Dimensions Inc..... 111..... 70
Platinum Technology.....	16		<i>These indexes are provided as a reader service. Although every effort has been made to make them as complete as possible, the publication does not assume liability for errors or omissions.</i>
Racal-Datcom.....	40		

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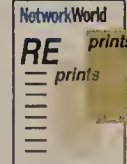
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## Nortel

Continued from page 1

ment system. The first fruit of the alliance is expected to be a melding of Nortel's Magellan Passport ATM switch and Meridian 1 PBX into a box managed by Spectrum, due out next summer or fall.

Meanwhile, AT&T this month will begin controlled introduction of an ATM aggregator to convert voicestreams from its Definity PBX into ATM cells for shipment over the wide area.

AT&T already enables partial SNMP management of PBXs through its OneVision platform, based on Hewlett-Packard Co.'s HP OpenView, potentially giving it some control over aggregator-based PBX/ATM environments.

Observers noted that AT&T's PBX division — Global Business

Communications Systems — earlier this year signed a deal to resell data equipment from Cabletron rival Bay Networks, Inc., although Cabletron still maintains a relationship with another AT&T division (see graphic).

## TDM in, ATM out

AT&T's new ATM aggregator will act as an adjunct to the Definity Enterprise Communications Server. A T-1 line connected to the aggregator takes in time-division multiplexed voicestreams, breaks them up into ATM cells and ships them to a remote aggregator that reconverts the traffic, said Susan Barbier, director of strategy and planning for Definity.

If tests prove successful, the external aggregator will be introduced in February and later incorporated into Definity itself.

## Who's reselling whom?

Bay and Cabletron each have a key AT&T business unit as a partner, and both units are going elsewhere in the upcoming AT&T breakup.

Current AT&T division...	Which primarily sells...	And will become...	Resells data communications equipment from...
Global Business Communications Systems	PBX systems	Part of the spun-off communications equipment company	Bay
Global Information Solutions	Servers, computer products	A stand-alone company	Cabletron

## Microsoft

Continued from page 12

ware vendors can build products that work with SNA Server.

Microsoft already has teamed up with Polaris Communications, Inc., which will combine its System 2000 Gateway with SNA Server to provide access to mainframe resources over IBM's fiber-based Enterprise Systems Connection channels. An agreement with Sourcecom Corp. will enable SNA Server to work with the company's Incarda server-based router card.

Other vendors, such as Computerm Corp., Bay Networks, Inc. and Cabletron Systems, Inc., also announced support for SOGA.

"As users have deployed centralized gateways in new client/server, TCP/IP-based environments, the available WAN bandwidth has started to become strained, and as more branch offices are brought online, the issue becomes worse," said Vesa Snomalainen, general manager of Microsoft's SNA Product Unit.

"We are giving users a choice of retaining the centralized gateway approach or distributing

SNA Servers to branch offices, concentrating traffic and sending what's necessary over the WAN to the host," he said.

In the centralized approach, a user with 20 remote PCs would require 20 separate SNA physical unit sessions with a central gateway. With the distributed gateway, those 20 PCs would link to a local SNA Server and the server would establish a single link to a central SNA Server or IBM front-end processor.

Users at the Bank of Hawaii in Honolulu are not only evaluating SNA Server's SOGA support for its scalability, but also for its ability to keep the SNA sessions alive over the bank's TCP/IP net.

"We can't afford to have SNA sessions drop from our branch offices, and so far SNA Server has not dropped sessions," said Mark Lee, systems consultant with the bank. He said the bank is evaluating other solutions, such as IBM's AnyNet package. AnyNet lets applications communicate with one another, regardless of the underlying protocol.

The SNA service pack with the Distributed Gateway Service will be available for SNA Server 2.11 in January.

©Microsoft: (206) 882-8080.

The aggregator is similar to customer premises equipment designed to produce T-1 cellstreams for the budding T-1 ATM market, such as ADC Kentrox's AAC-1 data service unit/channel service unit, said Thomas Nolle, president of CIMI Corp., a consulting firm in Voorhees, N.J.

But unlike ADC Kentrox, AT&T may be able to incorporate channel-associated signaling into the aggregator, Nolle said. Then the 24 individual 64K bit/sec streams within a T-1 pipe could be sent to different loca-

tions, instead of the entire T-1 connection terminating at the same location.

## Prototype interest

The proposed Cabletron/Nortel deal is only the latest ATM-switch/PBX merger news Nortel customers have heard. Before making the Cabletron alliance, Nortel showed customers a prototype of a combined ATM switch/PBX to be managed by SNMP.

SNMP management over WANs could ease the burden of

hiring technical personnel at the remote sites.

But Dawson Newberry, director of MIS at Gerald Metals, Inc. in Stamford, Conn., balked at having his PBX maker specify a single application, such as Spectrum, to accomplish this.

"We're basically an HP shop, and we do use OpenView," Newberry said. "If they came to me and said, 'Use this other software,' I'd say, 'Take a hike.'"

Staff Writer Jodi Cohen contributed to this story.

## Cisco

Continued from page 1

vendor, but four over a two-year period.

So it should come as no surprise that when the company made a commitment to client/server computing internally, it did so in a big way. Cisco's deployment this year of a 1,000-user Oracle Corp. client/server application network is Oracle's largest installment and probably one of the most ambitious such projects around.

The integrated order-entry, financial and manufacturing applications have paid the desired dividends in a hurry, including better customer service and easier employee access to data. The software lets Cisco employees access the data needed to process customer orders, for instance, by looking up supplier delivery dates to schedule customer shipments.

Deployed over eight months, the applications enable Cisco to leverage the powerful desktop PCs and Macintosh computers with which its employees are equipped, said Peter Solvik, Cisco's vice president of information systems and chief information officer.

"The applications provide a platform [to support] rapid changes in the company and market. For instance, [the system allows us to] distribute inventory and operations to various locations in the world as we grow and customer requirements change," he said.

## Trying a new route

The move to client/server became a priority for Cisco last year as it had outgrown its 7-year-old Spectrum Associates Inc., Minx system, which ran on Unix and was accessed by end users via a terminal-emulation interface. The Minx system could not handle the growing volume of users and left Cisco vulnerable because it required a lengthy restore procedure following sys-

tem crashes.

The new applications are anchored by a common Oracle database distributed over five Sequent Computer Systems, Inc. servers based on more than 100 processors and accessible via the firm's TCP/IP net. Failover capabilities in the database and hardware ensure minimal downtime.

## KEYS TO THE MOVE

- ▶ Make the client/server conversion a business initiative, not just an IS initiative.
- ▶ Pick the best people from each area of IS to work on the new system, and hire outside people to support and maintain the legacy application.
- ▶ Since customization is inevitable, select software that allows work to be done with common tools and standard interfaces.

Two of the servers run Oracle Parallel Edition and utilize technology called Distributed Concurrent Manager, which manages the processing across the parallel systems in the cluster. This parallel architecture helps deliver quick response time, even during peak processing periods.

Cisco uses the replication capabilities of the database to transfer and update information to a reporting and disaster recovery site in Raleigh, N.C. Additional replication in the form of the very basic Oracle Complex Snapshot technology, also part of Oracle7, is used to distribute data from the Oracle application database to other applications in the company, including a corporate data warehouse.

## Mission accomplished

By deploying the Oracle software so it's accessible by users across the company, Cisco has reduced by 75% the number of redundant reporting databases, in-house developed applications and point-to-point application

interfaces, Solvik said. For instance, Cisco eliminated redundant Oracle and Sybase, Inc. databases that had been built by various groups over time for reporting and different transaction systems.

While an eight-month implementation for several large-scale applications is a big achievement, it is not as though the applications slid right in, Solvik said. He estimated that the 100 people working on the project customized the software in about 200 places, the equivalent of keeping a full-time worker busy for eight years. Solvik said he chose Oracle applications, though, because they were easily extensible with common tools and APIs.

In addition, the company put some of its own technology to work to help support traffic generated by the new applications. Cisco converted from shared network segments to switched Ethernet between the main database server in California and the database in North Carolina, largely a result of increased traffic caused by data replication.

Another overhaul — the segmenting of all manufacturing traffic over a LightStream 2020 Asynchronous Transfer Mode switch — was needed to lighten the load on an already overburdened FDDI LAN, Solvik said.

The biggest challenges, though, resulted from the lack of tools for "handling issues that come up with a distributed model," he said, adding that tools which help users to do better benchmarking to size applications and hardware are sorely needed.

"The tools to maintain large-scale Unix transaction processing clusters are not nearly as prevalent or mature as similar tools in the IBM mainframe market. But that is changing quickly. We are continually evaluating and implementing new tools, as well as writing our own when the technology is not readily available," Solvik said. ■



## Newsstand

Continued from page 1

offer more expensive, fuller featured clients, company insiders said.

### Web in the news

Lotus will continue its assault on the Web by revising Newsstand. The current product lets Notes customers create sophisticated documents using Lotus publishing tools and upload them to a Lotus-hosted Newsstand server for distribution to other Notes users.

The expanded Newsstand service will be able to make those publications available for distribution over the 'Net to anyone with a Web browser and authorization to read the documents.

Lotus will show an alpha version of the service at Lotusphere and hopes to ship it shortly afterward, sources said.

Newsstand on the Web, as it's dubbed, will handle subscriptions, credit card validation, user authentication and security.

"For information providers who are already developing in Notes, I think it's very significant, particularly if they don't yet have an Internet strategy," said David Marshak, a senior consultant with Patricia Seybold Group, Inc. in Boston. "It makes

it very easy for them."

Right now, information providers who employ Notes can take a do-it-yourself approach to get their publications onto the Internet. They can purchase the Lotus InterNotes Web Publisher to automatically translate their documents and databases into HTML.

But with the new Newsstand on the Web service, Notes customers will not need to buy that product since Lotus itself will pump the documents through the InterNotes Web Publisher to make them ready to serve over to the Internet.

Lotus thinks its approach is just the ticket. "If you're in the publishing business, you're going to have to look at the World-Wide Web one of these days," said Dick Muccini, director of sales and marketing for Newsstand.

### Where do I sign up?

Plans call for a Newsstand guide to be published to a Hypertext Transfer Protocol server using InterNotes. Anyone with a Web browser could fill out a subscription request after perusing

the guide, and the form would go to Newsstand manager software. A corporate coordinator within the end-user organization

*"If you're in the publishing business,*

*you're going to have to look at the World-*

*Wide Web one of*

*these days,"*

*Muccini said.*

would then approve the request, disapprove it or put in on hold. Users also could provide their own credit card, bypassing the corporate coordinator approval process.

If the request is approved, the security program would be executed at the Newsstand server, which grants access to the publication.

The subscription request would then be replicated to the content information provider via the Newsstand manager. A

URL pointing to the publication would then be sent to the customer.

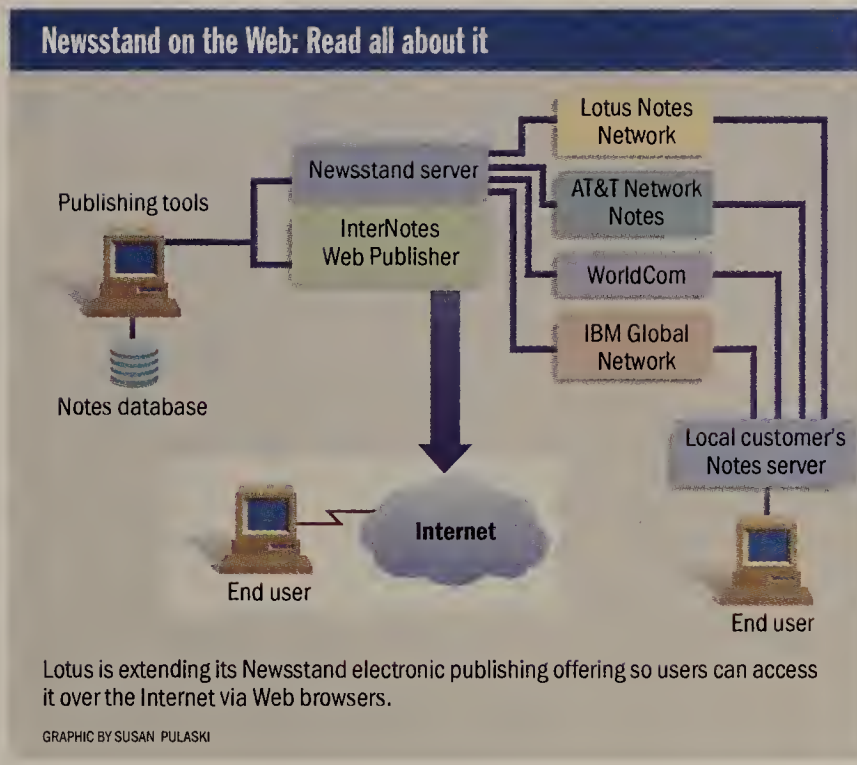
Limiting Newsstand to Notes, even with the major carriers supporting Notes, has not been an attractive approach for content providers. "What publisher would want to just publish to people who are using Notes?" Marshak said.

Marshak said companies that are starting to think about sending their publications to the Web will probably start with the Web and Notes will be an afterthought. "But Newsstand says, hey, you can do the same amount of work and be on both," Marshak said.

Not only will Lotus add strong Web support to Newsstand and Web-surfing characteristics to

the Notes 4 client, it also will make Web support on Notes servers more robust, sources said.

One approach is to add the InterNotes HTML/Notes conversion technology to the base Notes server, allowing the server to more easily host Web data. The current InterNotes tool is sold separately. ■



## Muxes

Continued from page 1

prototype of the product, will demonstrate the completed offering at ComNet next month (NW, Jan. 23, page 17).

The box employs wavelength-division multiplexing (WDM), a technology that transmits different types of data at distinct optical wavelengths—or colors of light—over a single channel. Conventional optical fiber has a bandwidth of 25,000 GHz that MuxMaster breaks up into usable chunks.

Typical fiber-optic muxes can handle only one stream at a time, and the usual fiber-optic transmission uses only .008%

to .02% of the total capacity of each fiber being utilized, IBM officials said. Customers also have to lease two optical fibers to make up a two-way channel, whereas MuxMaster needs one.

Analysts said MuxMaster would be most cost-effective to users with existing fiber-optic backbones that needed extra capacity but cannot add fiber,

such as those companies in big cities where installing fiber can be a nightmare.

"Its biggest application today is as a fiber conservation tool, but most organizations deploying fiber-optic backbones aren't facing the bandwidth problem the MuxMaster is attempting to solve," said Thomas Nolle,

president of the CIMI Corp. consultancy in Voorhees, N.J. "Most users have a long way to go before they need this type of capacity."

Nolle recommends that companies with existing fiber backbones look to increase speed and bandwidth of exiting lines before moving to an unproven technology such as WDM.

IBM is testing MuxMaster at two financial firms—Morgan Stanley and the Bank of Austria. The institutions are looking to use the device to support rapid disaster recovery by providing real-time data mirroring.

The 9729 MuxMaster is available. Pricing was not released. ■

*Nolle says firms with existing fiber backbones look to increase speed and bandwidth of exiting lines before moving to an unproven technology such as WDM.*

## Cabletron

Continued from page 10

high-speed uplink.

The four-slot box supports one controller module—which supervises access to the switching backplane—and as many as three network interface modules—which provide switched connectivity and high-speed uplinks.

Initially, Cabletron will offer a 24-port Ethernet switch module and a two-port FDDI network interface module.

### Jump-start switches

In addition to the stand-alone device rollout, Cabletron will revitalize its core Multi Media Access Control (MMAC) hub that is installed in 85,000 customer sites with the new MMAC SmartSwitch module.

"The MMAC was starting to run out of steam in terms of integrating some of the new switching technologies," MacAskill said.

"Cabletron really needed a good migration device that allows users to increase their bandwidth without having a real forklift upgrade impact on their environment," he added.

The MMAC SmartSwitch module has three slots for a control module and two network interface cards. Like all SmartSwitch devices, the modules support Remote Monitoring for embedded network analysis. The SmartSwitch products can be managed by Cabletron's Spectrum net management platform or any Simple Network Management Protocol-based system.

Pricing for the new SmartSwitch devices starts at \$2,595, and all products will ship in the first quarter of 1996.

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## COMMENTS?

See "How to reach us" on page 5.

## NetworkWorld

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# Back to Reality

## A high-tech way to plug pesky holes in network security

**A**s 20,000 GIs prepare to spend Christmas, Easter and God-knows-what other future holiday in picturesque Bosnia, thousands of logistics wizards are tuning high-tech war toys aimed at keeping those soldiers alive.

It won't be easy. In addition to frigid weather, hidden obstacles include six million antipersonnel land mines plus imported rent-a-rebel guerrillas who will be as ornery as New Yorkers in winter. War is evil and victory hard to define, especially in messy civil spats like Bosnia's, where everyone hates their neighbors.

Evil also creates headaches for network managers, especially when guerrilla hackers punch holes in corporate networks.

You may have heard about a not-so-good feature of Microsoft Corp.'s Network Neighborhood icon in Windows 95. It displays networked users of that operating system, plus users of Windows NT and Windows for Workgroups. Those users' PCs are sitting ducks for miscreants who can browse, modify or delete unprotected files and applications.

But let's assume that your users are smarter than most and permit access only to files in sharable directories. Have you heard about the "..." bug? It allows snoopers to issue the CD .. command and access files and directories *above* the sharable directory. Get your patch to fix this problem from <http://www.microsoft.com/windows>.

Hackers will also raise havoc by preying on Windows PCs with feeble passwords. Unlike secure operating systems that lock out access after three incorrect password attempts, Windows 95 is an open door. It doesn't log any faulty password attempts, which means users never know when they are under attack.

Most passwords are a joke. Amateur hackers can guess the usual suspects, such as USER, WINDOWS, a user's name and so forth. Serious hackers don't bother guessing; they use password dictionaries.

I met a man who recently used this tool for a simulated brute-force attack on a Windows 95 PC, running about 200 passwords per second. His dictionary can apply 18,000 passwords in less than two minutes. Some multilingual password dictionaries contain 30M bytes of options.

The man is Christopher Klaus, CEO of Internet Security Systems, Inc. Its Internet Scanner software spots security holes in TCP/IP-based networks and can run simulation tests such as the one described above.

Klaus began writing his detection software as a hobby five years ago. He was inspired by *Neuromancer*, a technology cult novel written by William Gibson.

Klaus hangs out with security buffs at Carnegie Mellon

University's CERT Coordination Center, Sun Microsystems, Inc., Hewlett-Packard Co. and other Internet-related institutions. Each time they discover an Internet security hole, Klaus' staff adds a feature to the Internet Scanner to ensure that it can identify the weakness.

These digital flaws are like hidden land mines, waiting to cause trouble. "It only takes one vulnerability to compromise your network," Klaus says.



David J. Buerger

Internet Scanner monitors more than 120 known security holes, up from 70 a year ago. Klaus aims to keep his software the most comprehensive checker available.

By comparison, the infamous freeware program, Security Administrator Tool for Analyzing Networks (SATAN), checks for about 20 holes, according to Klaus. The only other competitor is Bellcore's

PingWare, which is more limited than SATAN.

Klaus sees a shift in hacking for amusement to hacking for profit. "It's a new breed of profit-seeking criminals, not old hackers changing," he said. Network managers must fight back with tools like these to thwart digital thieves from wreaking havoc.

Internet Scanner is run on a Unix host on your network. The software checks every TCP/IP device for known security holes, then prints a report detailing each weakness.

A common example is Novell, Inc. NetWare servers running dual protocol stacks. A poor configuration could allow outsiders to access internally shared resources.

The software also can be used to test the vulnerability of firewalls, which Klaus says are often ill-configured. "Companies often think their network is safe when it's not."

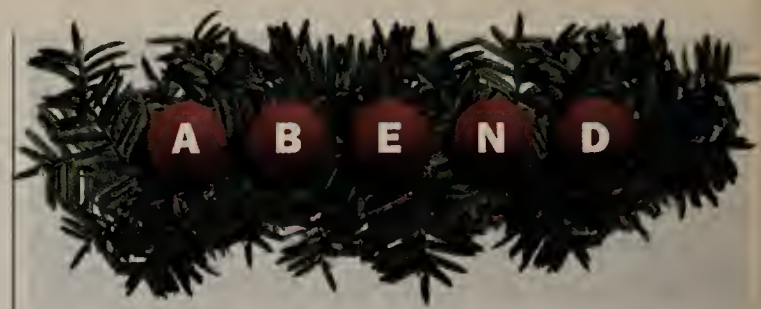
Simply finding the holes is not enough. Internet Scanner also helps network managers plug the holes. The software has an HTML-based option that provides hot links to vendor Web servers, allowing you to download patches that fix problems. Klaus says patches can be applied automatically.

The software cannot be used to hack unauthorized networks. It ships with a preauthorized IP address scan range, which corresponds to addresses assigned to the purchaser's private network.

You can learn more at <http://iss.net> or contact Klaus directly at [cklaus@iss.net](mailto:cklaus@iss.net). Internet Scanner's cost ranges from \$80 per device for small networks to less than \$20 for large sites.

U.S. soldiers headed for Bosnia will use the best technology to safeguard their security. Network managers should do the same to protect data under their care.

*Buerger is an Atlanta-based writer and industry consultant. He can be reached at [dbuerger@pipeline.com](mailto:dbuerger@pipeline.com).*



Have you been naughty or nice? Abend doesn't care. Abend just wants to have some Christmas fun on the 'Net...

### And a partridge in a pear tree

First stop is the 12 Sites of Christmas. Yes, there really are Web links for each and every day, from the 12 drummers drumming (OK, a page about drums and percussion instruments) to a recipe for French hens.

<http://www.netsurf.com/12sites.html>

### So that's where they went!

Have you been wondering what Intel did with all those defective Pentium chips? They made them into gold-plated, snowflake-shaped, genuine Intel Inside Christmas ornaments. And at only \$7.95 apiece, they're a steal (matching Pentium cuff links are also available for \$9).

<http://www.intel.com/intel/intelis/shop/ornament.html>

### Lighting up

What would an on-line Christmas be without a visit to the

**Cygnus Support Christmas tree with the user-selectable lights?**

**OK, so it's not as innovative as it once was. But so what? Neither is "The Grinch Who Stole Christmas," and you still watch that.**

<http://www.cygnus.com/xmastree/>

### Aloha Santa

Sure, sure, you're dreaming of a white Christmas and all, but wouldn't you really rather be lounging on the beach on some tropical island, like, oh, Christmas Island? And it's only three hours from Hawaii!

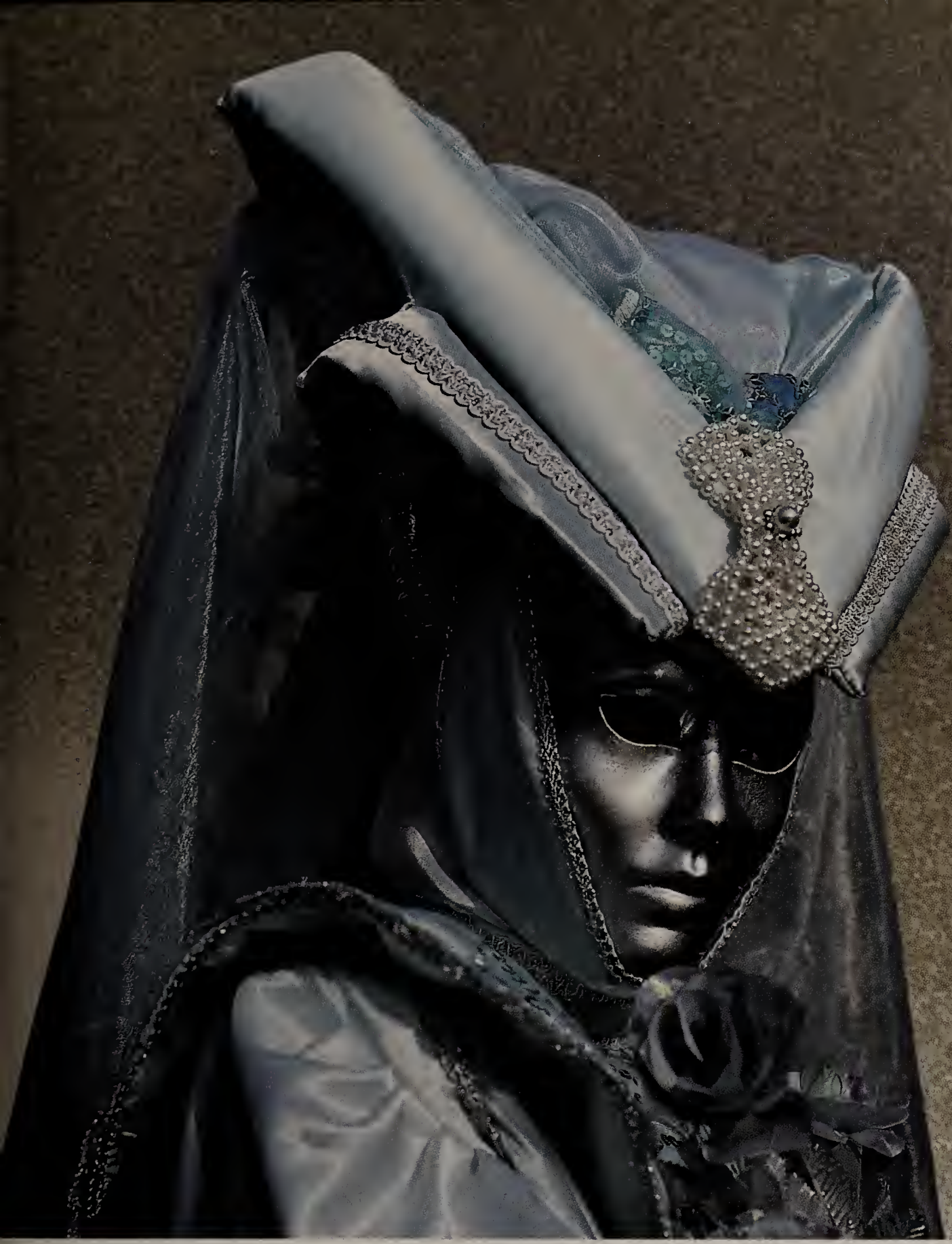
<http://www.best.com/~netilus/ChristmasIsland.html>

### Hair club for women

Uplifting morality tale or maudlin tearjerker? You decide, with your very own on-line copy of O. Henry's "The Gift of the Magi."

<http://www.america.net/christmas/magi.html>





Your desktops are humming.

They run Windows, OS/2  
and DOS.

They run thousands of  
applications.

But they also need access  
to your legacy system.

How do they get in?

What your computers need  
is a clever disguise.



**Can your  
software  
do this?**

Desktop computers were literally born to access information, using a variety of network protocols. But to get into your legacy system, they have to change their appearance. In a most clever way.

IBM emulators let your computers "change identities," looking just like terminals when needed. They work on all of the popular platforms, including Windows®, OS/2® and DOS. IBM emulation can even run without modification on Windows 95. So users can access legacy systems from anywhere with the same look and feel.

Our emulators are designed to run on more network protocols than anyone else's, from Ethernet and Token-Ring to TCP/IP and IPX/SPX. And we support access any way you want it — over the network, by wireless or by PC card adapter.

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Plus, if you buy Version 4.0 of our PC 3270 or AS/400® emulation packages for Windows by year's end, you'll qualify to receive a free upgrade to Personal Communications for Windows 95 through 7/31/96. So give all of your users access to information that can help them do their jobs better. Give us a call at 1 800 IBM-3333\*, ext. DA010 or visit our Web site at <http://www.raleigh.ibm.com/netad.html> for all of the details.

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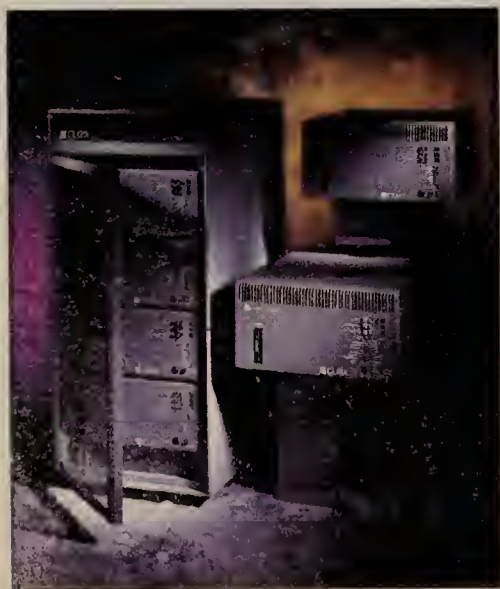
# FROM MUDDLED, CONFUSED, VULNERABLE



# FROM THIS... TO THIS.



# TO MANAGED, INTEGRATED, FAULT TOLERANT



*It all starts with a few specialty servers.*

*Then you add faxing, e-mail, a database or two, and remote access.*

*The breadracks become "dreadracks", wiring multiplies, heat builds, power consumption increases...and you can't manage your critical corporate services. You have chaos.*

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